

**DIVERSITY AND DISTRIBUTION OF MANGROVES IN REKAWA LAGOON, SRI LANKA:
GIS AND REMOTE SENSING APPROACH**

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Mangrove distribution in the Rekawa lagoon in the Hambantota District is decreasing mainly due to anthropogenic stresses. The challenges of conserving mangrove ecosystems can be overcome by the use of GIS and Remote Sensing methods. The objectives of this study were to determine the vertical distribution, horizontal distribution, species diversity and species distribution of mangroves in the Rekawa lagoon. Six quadrats (10 m × 10 m) were established in the identified three zones (two per zone): lagoonward zone (LAG), mid-zone (MID) and landward zone (LAN). The Shannon-Weiner Diversity Index, Simpson Diversity Index, Equitability of the Shannon Index and Equitability of the Simpson Index were calculated. Normalized Difference Vegetation Index, Normalized Vegetation Water Index and Combined Mangrove Recognition Index and mangrove distribution map were generated using Sentinel-2 satellite data and ArcMap (version 10.3). A total of 479 individuals of mangroves were recorded and represented by 8 species, 7 genera belonging to 5 families. As true mangrove species *Aegiceras corniculatum*, *Avicennia marina*, *Avicennia officinalis*, *Bruguiera gymnorrhiza*, *Ceriops tagal*, *Excoecaria agallocha*, *Lumnitzera racemosa* and *Rhizophora mucronata* were recorded. The highest density of species was recorded from zone LAG. The highest value for the Shannon-Weiner Diversity Index, the Equitability of the Shannon index, the Simpson's Diversity Index and the Equitability of Simpson were recorded by LAN (1.18, 0.9, 2.95 and 0.75, respectively). The vertical distribution maps revealed LAG and LAN were dominated by *R. mucronata* and *E. agallocha*, respectively. The overall accuracy and Kappa coefficients were 98.4% and 82.4%, respectively. Demarcation of species assemblages and distribution mapping of the mangrove ecosystem demonstrated the restricted distribution of mangroves due to encroachments. GIS and Remote Sensing, coupled with ecological studies, are promising tools to conserve and restore mangroves.

Keywords: GIS and Remote Sensing, Mangrove, Normalized Difference Vegetation Index, Rakawa lagoon, Sentinel-2