ABSTRACT

Changes in the coastal conditions of Demak Regency influenced by erosion, accretion, land conversion, and land subsidence have led to the degradation of mangrove ecosystems and increased the region's vulnerability to tidal flooding. This study aims to identify the dynamics of mangrove distribution in 2020 and 2025 and to determine the suitability of land for mangrove rehabilitation in the coastal areas of Demak Regency. The study was conducted using remote sensing technology and Geographic Information Systems (GIS). Sentinel-2 imagery was processed using Google Earth Engine (GEE) via the Normalized Difference Vegetation Index (NDVI) algorithm to determine mangrove vegetation information, including density, canopy cover, and distance from rivers. Digital Elevation Model (DEM) data were used to analyze topographic characteristics such as slope gradient. Land suitability assessment was performed using the Weighted Overlay method, which combines seven physical and biophysical parameters using the Area Suitability Index (ASI) approach. The study area covers a total of 27,972 ha, divided into 6,993 grid units measuring 200×200 meters. The analysis results show that the suitability of mangrove land along the coast of Demak Regency is dominated by the "Very Suitable" (S1) and "Moderately Suitable" (S2) classes. In 2020, there were 3,908 grid cells (S1), 2,901 grid cells (S2), and 184 grid cells (S3), while in 2025, these figures were 3,327 grids (S1), 3,459 grids (S2), and 207 grids (S3), with no grids classified as Unsuitable (N). Spatially, Bonang Subdistrict is dominated by the S1 class, while Sayung, Karangtengah, and Wedung Subdistricts are dominated by the S2 class. These findings indicate that most of the coastal areas of Demak Regency still have a high level of land suitability to support mangrove ecosystem rehabilitation and management.

Keywords: *Mangrove, Land Suitability, Sentinel-2, DEM, Demak Coast, Weighted Overlay.*