

INTI SARI

Ekosistem mangrove memiliki potensi dalam menyimpan karbon, terutama dalam bentuk karbon organik tanah. Namun, keterbatasan informasi mengenai mangrove yang ada di pulau-pulau kecil seperti Pulau Bangkombangkoang mengakibatkan tidak adanya pengelolaan yang tepat dan dapat mengancam keberlanjutan ekosistem ini. Penelitian ini bertujuan: (1) mengestimasi stok karbon organik tanah, (2) menganalisis faktor yang memengaruhi akumulasinya, (3) memetakan distribusi spasial karbon organik tanah, dan (4) menganalisis strategi pengelolaan mangrove di Pulau Bangkombangkoang. Metode yang digunakan meliputi *Loss on Ignition* (LOI), uji regresi linear berganda, interpolasi *Inverse Distance Weighting* (IDW), dan analisis SWOT. Hasil penelitian menunjukkan rata-rata total stok karbon organik tanah mencapai $364,01 \pm 69,21$ Mg C ha⁻¹, dengan akumulasi tertinggi ditemukan pada kedalaman 60 – 100 cm. Tinggi vegetasi berpengaruh signifikan terhadap akumulasi karbon organik tanah (koefisien 344,294, p = 0,020). Sebaran karbon organik tanah bervariasi, tertinggi di bagian utara dan terendah di bagian selatan pulau. Strategi pengelolaan yang direkomendasikan berfokus pada kolaborasi antara masyarakat, pemerintah, dan akademisi dengan penguatan kelembagaan, peningkatan kapasitas sumber daya manusia, serta penerapan ekonomi berbasis karbon biru untuk memastikan keberlanjutan ekologis dan sosial-ekonomi ekosistem mangrove.

Kata kunci: mangrove, karbon organik tanah, pulau-pulau kecil.

ABSTRACT

Mangrove ecosystems have great potential for carbon storage, particularly in the form of soil organic carbon. However, limited information on mangroves located on small islands such as Bangkombangkoang Island has resulted in the absence of proper management, which may threaten the sustainability of this ecosystem. This study aims to: (1) estimate soil organic carbon stocks, (2) analyze the factors influencing their accumulation, (3) map the spatial distribution of soil organic carbon, and (4) analyze mangrove management strategies on Bangkombangkoang Island. The methods used include *Loss on Ignition* (LOI), multiple linear regression analysis, Inverse Distance Weighting (IDW) interpolation, and SWOT analysis. The results showed that the average total soil organic carbon stock reached $364,01 \pm 69,21 \text{ Mg C ha}^{-1}$, with the highest accumulation found at depths of 60–100 cm. Vegetation height had a significant effect on soil organic carbon accumulation (coefficient = 344,294, $p = 0,020$). The distribution of soil organic carbon varied spatially, with the highest concentrations found in the northern part and the lowest in the southern part of the island. The recommended management strategy emphasizes collaboration among communities, government, and academics through institutional strengthening, capacity building, and the implementation of a blue carbon-based economy, aiming to ensure the ecological and socio-economic sustainability of the mangrove ecosystem.

Keywords: mangrove, soil organic carbon, small islands.