

Brema Armanda Barus NPM 190341100034. Analisis Perubahan Kondisi Ekosistem Mangrove Menggunakan Perhitungan Total Karbon dan MHI (*Mangrove Health Index*) Tahun 2017, 2020 dan 2025 di Desa Taddan, Kabupaten Sampang. Pembimbing **Prof. Dr. Zainul Hidayah, S.Pi., M.App.Sc**

ABSTRAK

Ekosistem mangrove memiliki peran penting dalam menjaga kestabilan wilayah pesisir serta sebagai penyerap karbon alami yang berkontribusi terhadap mitigasi perubahan iklim. Namun, meningkatnya aktivitas manusia dan perubahan lingkungan menyebabkan terjadinya degradasi ekosistem mangrove yang berdampak pada kondisi kesehatan dan kemampuan penyimpanan karbon. Penelitian ini bertujuan untuk menganalisis perubahan kondisi ekosistem mangrove berdasarkan perhitungan total stok karbon serta menilai tingkat kesehatan mangrove menggunakan Mangrove Health Index (MHI) pada tahun 2017, 2020, dan 2025 di Desa Taddan, Kabupaten Sampang. Metode penelitian yang digunakan yaitu pemanfaatan data citra satelit Sentinel-2A yang dikombinasikan dengan validasi data lapangan melalui pengukuran Diameter at Breast Height (DBH) menggunakan pendekatan alometrik. Pengolahan data dilakukan menggunakan perangkat lunak ArcGIS Pro untuk menghasilkan peta stok karbon dan peta Mangrove Health Index. Hasil penelitian menunjukkan bahwa kondisi ekosistem mangrove di Desa Taddan didominasi oleh kategori potential rehabilitation area, yang mengindikasikan tingkat kesehatan mangrove masih rendah dan memerlukan upaya rehabilitasi. Perubahan nilai stok karbon selama periode 2017, 2020 dan 2025 menunjukkan kecenderungan fluktuatif yang dipengaruhi oleh perubahan tutupan mangrove dan aktivitas manusia di wilayah pesisir.

Kata Kunci: Mangrove, Stok karbon, Mangrove Health Index, Sentinel-2A, Desa Taddan

Brema Armanda Barus NPM 190341100034. Analysis of Changes in Mangrove Ecosystem Conditions Using Total Carbon Calculations and MHI (Mangrove Health Index) in 2017, 2020, and 2025 in Taddan Village, Sampang Regency. Supervisor: **Prof. Dr. Zainul Hidayah, S.Pi., M.App.Sc**

ABSTRACT

Mangrove ecosystems play an important role in maintaining coastal stability and acting as natural carbon sinks that contribute to climate change mitigation. However, increasing human activities and environmental changes have led to mangrove ecosystem degradation, affecting both ecosystem health and carbon storage capacity. This study aims to analyze changes in mangrove ecosystem conditions based on total carbon stock calculations and to assess mangrove health status using the Mangrove Health Index (MHI) in 2017, 2020, and 2025 in Taddan Village, Sampang Regency. The research method utilized Sentinel-2A satellite imagery combined with field measurements of Diameter at Breast Height (DBH) for data validation using allometric approaches. Data processing was conducted using ArcGIS Pro software to generate carbon stock maps and Mangrove Health Index maps. The results indicate that the mangrove ecosystem in Taddan Village is predominantly classified as a potential rehabilitation area, indicating low mangrove health conditions that require rehabilitation efforts. Changes in carbon stock values during the 2017, 2020 and 2025 period showed fluctuating trends influenced by changes in mangrove cover and human activities in the coastal area.

Keywords: Mangrove, Carbon stock, Mangrove Health Index, Sentinel-2A, Taddan Village