

ABSTRAK

Kawasan Ekosistem Esensial (KEE) Mangrove Muara Kali Ijo merupakan kawasan rehabilitasi mangrove yang memiliki potensi dalam menyerap karbon. Ekosistem mangrove memiliki kemampuan dalam menyerap karbon tiga kali lebih banyak dari hutan terestrial lainnya. Penelitian ini bertujuan untuk mengestimasi stok karbon biomassa mangrove dan menganalisis profil vertikal karbon organik sedimen di KEE Mangrove Muara Kali Ijo, Kebumen. Metode penelitian yang digunakan yaitu survei dengan pengambilan data lapangan dan analisis laboratorium. Data kerapatan mangrove, biomassa atas, dan sedimen diambil dari tiga stasiun dengan interval kedalaman sedimen 0–15 cm, 15–30 cm, 30–50 cm, dan 50–100 cm. Analisis karbon organik sedimen dilakukan dengan metode Walkley-Black, sedangkan biomassa dihitung menggunakan persamaan alometrik. Hasil penelitian menunjukkan kerapatan mangrove tergolong padat (7.707 ind/Ha), didominasi oleh mangrove jenis *Rhizophora stylosa* (6.062 ind/Ha). Stok karbon biomassa atas mencapai (787,83 ton C/Ha), dengan nilai tertinggi pada stasiun 3 sebesar 337,68 ton C/Ha. Spesies *Nypa fruticans* menyimpan karbon lebih tinggi (10,21 ton C/Ha) dibandingkan *Avicennia alba* (3,37 ton C/Ha). Profil vertikal karbon sedimen menurun seiring bertambahnya kedalaman dengan rata-rata kandungan tertinggi pada lapisan permukaan dengan kedalaman 10 cm sebesar 12,58%.

Kata Kunci: Biomassa, Kerapatan, Mangrove, Sedimen, Stok Karbon

ABSTRACT

The Muara Kali Ijo Mangrove Essential Ecosystem Area (KEE) is a mangrove rehabilitation area that has the potential to absorb carbon. Mangrove ecosystems have the ability to absorb three times more carbon than other terrestrial forests. This study aims to estimate the carbon stock of mangrove biomass and analyze the vertical profile of organic carbon in sediments at the KEE Mangrove Muara Kali Ijo, Kebumen. The research methods used include field surveys and laboratory analysis. Data on mangrove density, above-ground biomass, and sediment were collected from three stations at sediment depth intervals of 0–15 cm, 15–30 cm, 30–50 cm, and 50–100 cm. Sediment organic carbon analysis was conducted using the Walkley-Black method, while biomass was calculated using allometric equations. The results showed that mangrove density was classified as dense (7,707 ind/Ha), dominated by the mangrove species *Rhizophora stylosa* (6,062 ind/Ha). Above-ground biomass carbon stock reached (787.83 tons C/Ha), with the highest value at station 3 at 337.68 tons C/Ha. The species *Nypa fruticans* stores higher carbon (10.21 tons C/ha) compared to *Avicennia alba* (3.37 tons C/ha). The vertical carbon profile of the sediment decreases with increasing depth, with the highest average content in the surface layer at a depth of 10 cm at 12.58%.

Keywords: Biomass, Density, Mangrove, Sediment, Carbon Stock

