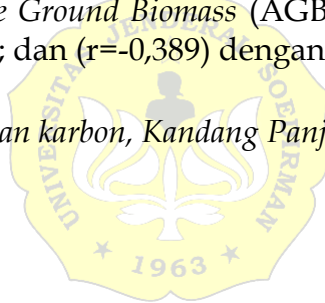


ABSTRAK

Pesatnya pertumbuhan sektor industri di berbagai negara serta beragamnya aktivitas manusia berkontribusi terhadap peningkatan emisi gas rumah kaca, khususnya karbon dioksida (CO_2) di atmosfer. Salah satu upaya untuk menurunkan emisi karbon adalah dengan menyerap dan menyimpan emisi dari atmosfer melalui pemanfaatan ekosistem mangrove. Penelitian ini bertujuan untuk mengetahui kerapatan mangrove dan kualitas perairan; cadangan karbon biomassa dan sedimen; profil vertikal karbon, serta hubungan antara kerapatan dengan cadangan karbon biomassa dan sedimen di ekosistem mangrove Kandang Panjang, Pekalongan. Metode penelitian yang digunakan yaitu metode survei dan metode pengambilan sampel yaitu *random sampling* pada 9 stasiun dengan 3 lapisan kedalaman atas (5-10 cm), tengah (20-25 cm), dan bawah (35-40 cm). Kandungan karbon organik diukur dengan metode *Loss on Ignition*. Hasil penelitian menunjukkan kerapatan di ekosistem mangrove Kandang Panjang menunjukkan kategori sedang hingga sangat rapat. Cadangan karbon total pada biomassa dan sedimen berturut turut 177,37 ton C/ha ($9,85 \pm 7,20$ ton C/ha) dan 55,38 ton C/ha ($6,15 \pm 1,87$ ton C/ha). Rata-rata kandungan karbon organik sedimen pada lapisan atas sebesar 1,25%, lapisan tengah 0,96%C, dan lapisan bawah sebesar 1,07%. Kerapatan mangrove memiliki nilai korelasi sedang ($r=-0,550$) dengan karbon *Above Ground Biomass* (AGB); ($r=-0,521$) dengan karbon *Below Ground Biomass* (BGB); dan ($r=-0,389$) dengan karbon sedimen.

Kata kunci: biomassa, cadangan karbon, Kandang Panjang, mangrove, sedimen.



ABSTRACT

The rapid growth of the industrial sector in various countries and diverse human activities contribute to the increase in greenhouse gas emissions, particularly carbon dioxide (CO₂), in the atmosphere. One effort to reduce carbon emissions is by absorbing and storing emissions from the atmosphere through the utilization of mangrove ecosystems. This study aimed to determine the mangrove density and water quality; carbon stocks in biomass and sediment; vertical carbon profile; and the relationship between mangrove density and carbon stocks in biomass and sediment in the Kandang Panjang mangrove ecosystem, Pekalongan. The research employed a survey method, with random sampling at 9 stations and 3 sediment depth layers: surface (5–10 cm), middle (20–25 cm), and bottom (35–40 cm). Organic carbon content was measured using the Loss on Ignition (LOI) method. The results showed that the mangrove density in the Kandang Panjang ecosystem ranged from moderate to very dense. The total carbon stock in biomass and sediment was 177.37 tons C/ha (9.85 ± 7.20 tons C/ha) and 55.38 tons C/ha (6.15 ± 1.87 tons C/ha), respectively. The average organic carbon content in the sediment was 1.25% in the surface layer, 0.96% in the middle layer, and 1.07% in the bottom layer. Mangrove density showed a moderate negative correlation with Above Ground Biomass (AGB) carbon ($r = -0.550$), Below Ground Biomass (BGB) carbon ($r = -0.521$), and sediment carbon ($r = -0.389$).

Keywords: biomass, carbon stock, Kandang Panjang, mangrove, sediment

