

INTISARI

Bregasmalang sebagai Kawasan Strategis Provinsi (KSP) memiliki tipe pengelolaan mangrove yaitu konservasi, rehabilitasi, wanamina, dan tambak dengan vegetasi mangrove. Pengelolaan mangrove di Bregasmalang belum memperhatikan aspek karbon dan masih terbatasnya penelitian tentang karbon mangrove. Karbon menjadi jasa ekosistem penting mengingat stok yang dimilikinya. Stok tersebut dapat menjadi emisi dan jejak karbon karena adanya konversi mangrove menjadi tambak di Bregasmalang. Salah satu komoditas tambak dengan vegetasi mangrove di Bregasmalang khususnya Kota dan Kabupaten Tegal adalah bandeng. Hal ini perlu diperhatikan potensi emisi dan jejak karbonnya mengingat luasan mangrove di Kota dan Kabupaten Tegal yang lebih kecil dibandingkan dengan Kabupaten Pemalang dan Brebes. Penelitian ini bertujuan untuk membandingkan stok, menaksir potensi emisi, dan mengestimasi jejak karbon dari produksi komoditas bandeng.

Penelitian dilakukan di empat tipe pengelolaan mangrove yaitu mangrove konservasi (Desa Mojo), rehabilitasi (Desa Mojo dan Kaliwlingi), wanamina (Desa Pesantren dan Grinting), dan tambak dengan vegetasi mangrove (Kelurahan Muarareja dan Dampyak). Pengambilan data stok karbon dilakukan di lapangan lalu dianalisis di laboratorium. Metode garis transek diterapkan hingga mencapai 8 transek dan 48 plot. Sampel tanah dianalisis di laboratorium dengan metode Walkley Black. Total stok karbon didapatkan dengan menambahkan nilai dari tiga tampungan karbon, dengan nilai tampungan karbon selain tanah berawal dari persamaan alometrik. Emisi karbon diperoleh dengan metode penginderaan jauh lalu dianalisis dengan *stock-difference*. Sementara jejak karbon dihasilkan dari perhitungan berdasarkan data dari wawancara dan studi literatur.

Hasil penelitian menunjukkan stok karbon di Kawasan Bregasmalang tidak berbeda nyata dengan nilai 763,75 Mg ha⁻¹ (konservasi); 719,25 Mg ha⁻¹ (rehabilitasi); 680,71 Mg ha⁻¹ (wanamina); dan 688,81 Mg ha⁻¹ (tambak dengan vegetasi mangrove). Potensi emisi karbon dari perubahan penggunaan lahan mangrove menjadi tambak dengan vegetasi mangrove di Kota Tegal (Kelurahan Muarareja) dan Kabupaten Tegal (Kelurahan Dampyak) tahun 1988 masing-masing sebesar 120,53 Mg ha⁻¹ (442,36 Mg CO₂e ha⁻¹) dan 181,61 Mg ha⁻¹ (666,53 Mg CO₂e ha⁻¹). Potensi emisi karbon di lokasi yang sama tahun 2008 mengalami peningkatan masing-masing menjadi 188,22 Mg ha⁻¹ (690,77 Mg CO₂e ha⁻¹) dan 269,9 Mg ha⁻¹ (990,52 Mg CO₂e ha⁻¹). Jejak karbon penggunaan lahan dari produksi komoditas bandeng pada tambak dengan vegetasi mangrove di Kota Tegal (Kelurahan Muarareja) dan Kabupaten Tegal (Kelurahan Dampyak) berdasarkan potensi emisi tahun 1988 masing-masing mencapai 18,59 kg CO₂e dan 22,21 CO₂e. Jejak karbon di lokasi yang sama dengan data potensi emisi tahun 2008 menunjukkan kenaikan masing-masing yaitu 58,09 kg CO₂e dan 68,56 kg CO₂e. Berdasarkan hasil penelitian ini maka diperlukan penguatan dan pengayaan aksi ProKlim, penerapan IMTA, dukungan kebijakan, konservasi mangrove, dan penelitian lanjutan.

Kata kunci: Bregasmalang, karbon, mangrove, pengelolaan, perubahan iklim.

ABSTRACT

Bregasmalang as a Provincial Strategic Area (KSP) has types of mangrove management namely conservation, rehabilitation, silvofishery, and ponds with mangrove vegetation. The management of mangroves in Bregasmalang has not paid attention to the carbon aspect and there is still limited research on mangrove carbon. Carbon is an important ecosystem service considering the stock it has. These stocks can become emissions and carbon footprints due to the conversion of mangroves into ponds in Bregasmalang. One of the fishpond with mangrove vegetation commodities in Bregasmalang, especially Tegal City and Regency, is milkfish. It is necessary to pay attention to the potential for emissions and carbon footprint considering that the area of mangroves in Tegal City and Regency is smaller compared to Pemalang and Brebes Regencies. This study aims to compare stocks, estimate potential emissions and carbon footprint of milkfish commodity production.

The research was conducted in four types of mangrove management, namely conservation mangroves (Mojo Village), rehabilitation (Mojo and Kaliwlingi Villages), silvofishery (Pesantren and Grinting Villages), and ponds with mangrove vegetation (Muarareja and Dampyak Villages). Carbon stock data collection is carried out in the field and then analyzed in the laboratory. The line transect method was applied up to 8 transects and 48 plots. Soil samples were analyzed in the laboratory using the Walkley Black method. The total carbon stock is obtained by adding the values of the three carbon pools, with the value of the non-soil carbon pool starting from the allometric equation. Carbon emissions are obtained by remote sensing methods and then analyzed by stock-difference. While the carbon footprint is generated from calculations based on data from interviews and literature studies.

The results showed that the carbon stocks in the Bregasmalang area were not significantly different with a value of 763.75 Mg ha⁻¹ (conservation), 719.25 Mg ha⁻¹ (rehabilitation), 680.71 Mg ha⁻¹ (silvofishery), and 688.81 Mg ha⁻¹ (ponds with mangrove vegetation). Potential carbon emissions from changing the use of mangrove land into fishponds with mangrove vegetation in Tegal City (Muarareja Village) and Tegal Regency (Dampyak Village) in 1988 were 120.53 Mg ha⁻¹ (442.36 Mg CO_{2e} ha⁻¹) and 181, 61 Mg ha⁻¹ (666.53 Mg CO_{2e} ha⁻¹) respectively. Potential carbon emissions at the same location in 2008 increased to 188.22 Mg ha⁻¹ (690.77 Mg CO_{2e} ha⁻¹) and 269.9 Mg ha⁻¹ (990.52 Mg CO_{2e} ha⁻¹) respectively. The land use carbon footprint of milkfish commodity production in ponds with mangrove vegetation in Tegal City (Muarareja Village) and Tegal Regency (Dampyak Village) based on potential emissions in 1988 reached 18.59 kg CO_{2e} and 22.21 CO_{2e} respectively. The carbon footprint in the same location as the potential emission data for 2008 shows an increase of 58.09 kg CO_{2e} and 68.56 kg CO_{2e} respectively. Based on the results of this study, it is necessary to strengthen and enrich ProKlim's actions, implement IMTA, policy support, conserve mangroves, and follow-up research.

Keywords: Bregasmalang, carbon, climate change, management, mangrove