

**ESTIMASI SIMPANAN KARBON PADA TEGAKAN DAN  
SUBSTRAT *MANGROVE* DI HUTAN REHABILITASI *MANGROVE*,  
DUSUN PANDANSARI, DESA KALIWLINGI,  
BREBES, JAWA TENGAH**

**INTISARI**

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Alih fungsi hutan *mangrove* menjadi areal pertambakan dapat menyebabkan terjadinya penurunan potensi hutan sebagai tempat *absorber* dan *reservoir* CO<sub>2</sub> sehingga berubah menjadi penyumbang emisi CO<sub>2</sub>. Program dari pemerintah untuk mengurangi emisi karbon yaitu rehabilitasi hutan *mangrove* salah satunya di Dusun Pandansari, Desa Kaliwlingi, Brebes. Tujuan penelitian ini adalah (1) mengetahui kerapatan dan komposisi vegetasi di kawasan rehabilitasi *mangrove*, (2) mengestimasi simpanan karbon vegetasi *mangrove* yang terdapat di atas permukaan tanah, karbon akar *mangrove* serta karbon yang terkandung dalam substrat lumpur *mangrove*, dan (3) mengetahui kemampuan kawasan rehabilitasi *mangrove* dalam menyerap CO<sub>2</sub> untuk umur tanam 5, 6, 7 dan 14 tahun di Dusun Pandansari, Desa Kaliwlingi.

Dua puluh petak ukur berukuran 10 x 10 m dibuat secara *systematic* pada kawasan rehabilitasi *mangrove* dengan jarak antar petak ukur adalah 50 m. Tanaman *mangrove* yang berada dalam petak ukur dengan ukuran diameter >5 cm disampling dan diukur diameternya serta diidentifikasi jenisnya. Pada petak ukur tersebut juga dilakukan pengukuran ketebalan lumpur serta pengambilan sampel tanah untuk diuji kandungan karbonnya dan nilai *bulk density*. Persamaan allometrik digunakan untuk menghitung nilai biomassa di atas permukaan tanah dan biomassa akar. Karbon dalam substrat lumpur dihitung dengan mengalikan *bulk density*, C-organik, luas kawasan dan ketebalan lumpur. Jumlah serapan karbon dihitung dengan mengalikan besarnya karbon yang diperoleh dengan konstanta 3,67.

Hutan rehabilitasi *mangrove* dengan luasan 5,96 ha memiliki rata-rata kerapatan pohon sebesar 1835 individu/ha yang didominasi oleh jenis *Rhizophora mucronata* sebesar 95% dan *Avicennia marina* sebesar 5%. Total simpanan karbon di Dusun Pandansari sebesar 535,46 ton C yang terdiri: (a) simpanan karbon di atas permukaan tanah yaitu 139,47 ton C; (b) simpanan karbon akar yaitu 69,53 ton C; (c) simpanan karbon pada substrat lumpur *mangrove* yaitu 326,46 ton C. Kemampuan penyerapan CO<sub>2</sub> dari atmosfer oleh hutan rehabilitasi *mangrove* di Dusun Pandansari sebesar 1965,14 ton CO<sub>2</sub>.

Kata kunci: biomassa, karbon, rehabilitasi *mangrove*

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**THE ESTIMATION OF CARBON STORAGE IN THE STANDS AND SUBSTRATE OF REHABILITATED MANGROVE FOREST, PANDANSARI HAMLET, KALIWLINGI VILLAGE, BREBES, JAWA TENGAH**

**ABSTRACT**

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The land use change of mangrove forests into fish ponds may cause into a decrease of forest function from being an absorber and reservoir of CO<sub>2</sub> into CO<sub>2</sub> emitter to the atmosfer. One of the government programs in reducing carbon emissions is mangrove forest rehabilitation, including the rehabilitation at Pandansari Hamlet, Kaliwlingi Village, Brebes. This research aimed to (1) identify the density and composition of vegetation in the rehabilitated mangrove forest, (2) estimate the total of carbon stored including carbon stored in the above ground biomass, in the tree roots and in the mangrove substrate, and (3) recognize the capacity of the mangrove area in absorbing CO<sub>2</sub> from the atmosfer based on stand ages of 5, 6, 7, and 14 years old at Pandansari Hamlet, Kaliwlingi Village.

Twenty plots of 10 x 10 m were established systematically on the mangrove area with a distance of 50 m among plots. Trees with diameter of >5 cm in each plot were sampled and measured for its diameter as well as identified for the species. The mud thickness was also measured, then soil samples were taken for analysing its carbon content and bulk density values. Allometric equation was used to calculate the amount of above ground biomass and root biomass. The carbon stored in the mangrove substrate was calculated based on its bulk density, carbon content, total area, and mud thickness. The amount of carbon absorbed by the forest was calculated using the total carbon stocks multiplied by the value of 3.67.

The average tree density of the 5.96 ha rehabilitated mangrove forest was 1835 trees/ha, dominated by 95% of *Rhizophora mucronata* and 5% of *Avicennia marina*. The total of carbon stock was 535.46 tons C that consists of (a) 139.47 tons C stored in the above ground biomass; (b) 69.53 tons C stored in the root biomass; (c) 326.46 tons C of carbon stored in the mud substrate of mangrove. The capacity of the mangrove forest in absorbing CO<sub>2</sub> from atmosfer was 1965.14 ton CO<sub>2</sub>.

**Keywords:** biomass, carbon stock, mangrove rehabilitation

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