ESTIMASI SIMPANAN KARBON DI KAWASAN REHABILITASI MANGROVE PANTAI UTARA KABUPATEN REMBANG

INTISARI

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Perubahan iklim global dan meningkatnya muka air laut menjadi isu hangat akhir-akhir ini. Sektor kehutanan memiliki peranan penting berkaitan dengan pencegahan pemanasan global yaitu dengan mengendalikan konsentrasi karbon di atmosfer, dimana karbon organik hasil fotosintesis dapat disimpan dalam biomassa tegakan hutan. Sebagai salah satu bagian dari ekosistem hutan, mangrove mempunyai fungsi sebagai penyedia jasa lingkungan melalui penyerapan karbon di atmosfer. Kerusakan mangrove di pantai utara Kabupaten Rembang akibat konversi lahan dan reklamasi pantai mungkin dapat mengakibatkan potensi simpanan karbon semakin menurun.

Penelitian ini bertujuan untuk mengetahui estimasi simpanan karbon di atas permukaan tanah, di bawah permukaan tanah, dan karbon di dalam tanah di kawasan rehabilitasi mangrove Kabupaten Rembang. Struktur dan komposisi vegetasi serta luasan masing-masing tahun tanam mangrove diamati untuk mengatahui kandungan biomassa dengan persamaan allometrik yang meliputi identifikasi jenis, pengukuran diameter batang pohon (DBH), dan menghitung kerapatan. Pengambilan sampel tanah tidak terusik dilakukan untuk mengetahui *bulk density* serta sampel tanah terusik dilakukan untuk mengetahui C-organik.

Dari hasil penelitian menunjukkan bahwa terdapat tiga jenis penyusun mangrove di kawasan rehabilitasi Desa Pasar Banggi Kabupaten Rembang yaitu *Rhizophora mucronata*, *Rhizophora apiculata*, dan *Sonneratia alba*. Rata-rata kerapatan vegetasi sebesar 4660 ± 1464 pohon/ha dengan rata-rata DBH 8,7 cm. Rata-rata kerapatan tertinggi terdapat pada kelas diameter 5 – 9 cm yaitu sebesar 3770 ± 1798 pohon/ha. Dengan luas kawasan 4,174 ha, total simpanan karbon di kawasan rehabilitasi mangrove sebesar 928,461 ton yang meliputi : (a) *above-ground* karbon sebesar 493,834 ton; (b) *below-ground* karbon sebesar 227,990 ton; dan (c) karbon di dalam tanah sebesar 206,637 ton. Simpanan karbon di atas permukaan tanah memiliki presentase tertinggi sebesar 53%, sedangkan sisanya merupakan presentase karbon di bawah permukaan tanah (25%) dan karbon di dalam tanah (22%). Hasil estimasi simpanan karbon menunjukkan bahwa kemampuan kawasan rehabilitasi mangrove dalam penyerapan gas CO_2 dari atmosfer adalah sebesar 3404.357 ton dengan rata-rata 815.610 ton CO_2 per ha.

Kata kunci : mangrove, biomassa, simpanan karbon, persamaan allometrik, serapan CO_2

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THE ESTIMATION OF CARBON STOCKS IN THE REHABILITATION AREA OF MANGROVES NORTH COASTAL REMBANG REGENCY

ABSTRACT

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The changes of global climates and the rising of sea level have became a hot issue lately. The forestry sector has an important role on preventing global warming by controlling the concentration of carbon in the atmosphere through plant photosynthesis. The results of photosynthesis of organic carbon stored in the biomass of forest stands. As one of forest ecosystems, mangroves also have a function to provide environmental services by absorbing carbon in atmosphere. However, due to damages caused by land conversion and coastal reclamation, mangrove ecosystem has been degrading which futher may decrease its carbon sequestration potential.

This research aims to determine the estimates of carbon stored above-ground, below-ground, and carbon in soil in the area of mangrove rehabilitation. The structure and composition of vegetation, as well as the extent of each year of planting mangroves were also observed. In relation to this, trunk diameter (DBH) were measured to estimate the amount of the biomass using allometric equation. Undisturbed soil sampling was conducted to determine the bulk density, while soil disturbed soil were sampled to find out the C-organic matter.

The results showed that there are three mangrove species grown in the rehabilitation area Pasar Banggi Village of Rembang Regency that were *Rhizophora mucronata*, *Rhizophora apiculata*, and *Sonneratia alba*, with the total area of 4.174 ha. In the rehabilitation area of four plantation periode in Rembang, average density of vegetation is 4660 ± 1464 trees per ha with an average of DBH on 8.7 cm. Based on the diameter class, the mean of highest vegetation density is belong to the diameter class of 5 – 9 cm, which is 3770 ± 1798 trees per ha. The total estimation of carbon stock in mangrove rehabilitation area of Rembang is 928.461 tonnes which in : (a) above-ground carbon at 493.834 tons, (b) below-ground carbon at 227.990 tons, and (c) carbon in the soil amounted to 206.637 tons. Carbon stored in above-ground biomass have the highest proportion of 53%, while the rest are stored in below-ground biomass (25%) and carbon in the soil (22%). The mangrove rehabilitation area of Rembang is potentially absorp 3404.357 tonnes of CO_2 from the atmosphere. This has revealed that 815.610 tonnes of CO_2 per ha in average.

Key words : mangroves, biomass, carbon stocks, allometric equation, CO_2 absorption

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