



SIMPANAN KARBON HUTAN *MANGROVE* HASIL REHABILITASI DI PANTAI UTARA PEMALANG

INTISARI

Kristo Damanik

Ekosistem *mangrove* merupakan ekosistem yang unik yaitu siklus hara yang cenderung lambat karena terendam air, sehingga memungkinkan penimbunan karbon yang lebih tinggi daripada di hutan bukan *mangrove*. Penelitian ini bertujuan untuk mengetahui simpanan karbon dalam kawasan *mangrove* yang meliputi *above ground carbon*, *below ground carbon* dan karbon dalam substrat lumpur *mangrove*. Untuk mengetahui simpanan karbon dibutuhkan data tentang kerapatan dan komposisi vegetasi *mangrove*, sehingga penelitian ini juga bertujuan untuk mengetahui kerapatan dan komposisi vegetasi *mangrove*. Dari data simpanan karbon kawasan tersebut kemudian dicari besar serapan gas karbon dioksida (CO₂) melalui metode perbandingan *atom relative*.

Plot sampel dibuat sebanyak 12 plot berbentuk lingkaran dengan jari-jari (r)=10 m dan setiap tahun tanam dibagi menjadi 3 plot. Data yang dijadikan parameter dalam penelitian ini adalah diameter vegetasi *mangrove* dan jenis penyusun vegetasi. Biomassa vegetasi dihitung dengan persamaan allometrik, kemudian diasumsikan bahwa 50% dari biomassa tersebut merupakan karbon (Brown, 1997). Untuk menghitung kandungan karbon dalam substrat maka sampel lumpur dianalisis dengan metode *Walkey and Black*.

Jenis tanaman penyusun vegetasi yang ditemukan pada empat tahun tanam yang diteliti adalah *Rhizophora mucronata* dan *Avicenia marina*. Kerapatan rata-rata 4007 individu/ha dengan rata-rata komposisinya 65,3 % *Avicenia marina* dan 34,7% *Rhizophora mucronata*. Vegetasi ini didominasi oleh kelas diameter 5 – 9,9 cm dengan rata-rata kepadatan 3651 individu/ha. Kawasan ini ditanami dengan *Rhizophora mucronata* 2x2 m seluas total 87 ha. Dari hasil perhitungan diperoleh rata-rata simpanan karbon di atas permukaan tanah sebesar 75,62 tonC/ha, di bawah permukaan tanah sebesar 34,22 tonC/ha dan di dalam substrat *mangrove* sebesar 180,55 tonC/ha. 62% dari karbon kawasan tersebut tersimpan di dalam substrat, 26% diantaranya terdapat di atas permukaan tanah dan sisanya berada di bawah permukaan tanah (akar). Serapan karbon dioksida (CO₂) yang diperoleh sebesar 88349,82 tonCO₂ dengan rata-rata 1015,51 tonCO₂/ha.

Kata kunci : *mangrove*, persamaan allometrik, C-organik, simpanan karbon

Mahasiswa Jurusan Konservasi Sumberdaya Hutan, Fakultas Kehutanan,
Universitas Gadjah Mada, Yogyakarta.

CARBON STOCK IN MANGROVE REHABILITATION AT PEMALANG NORTHERN COAST

ABSTRACT

Kristo Damanik

Mangrove ecosystem is a unique ecosystem because it has a slow nutrient cycle, due to its submerged environment. Thus, it allows a higher carbon accumulation process occurred compare to in non-submerged environment/terrestrial environment. The purpose of this research is to estimate carbon stock in rehabilitation mangrove forest at Pemalang. The including above ground carbon stock, below ground carbon stock, and carbon contained in the mangrove substrate. To estimate carbon stock needed data about the density and composition of mangrove vegetation. So, the purpose of this research also to indentify the density and composition of mangrove vegetation. The result of carbon stock accountied were then used to determine the uptake of carbon dioxide gas (CO₂) using a method of relative atom comparison.

Three circular sampling plot of 10 meter radius were established in each planting year of 2000 - 2003. DBH was measured and tree species was identified is from the plots. The biomass of mangrove vegetation were accountied using allometric equation, with assumption that 50% of the biomass contain carbon (Brown, 1997). In order to calculated carbon contained in the mangrove substrate, the mud samples was analyzed with Walkey and Black method.

There were two species identified from the four planting year, which are *Rhizophora mucronata* and *Avicenia marina*. The average of vegetation density was 4007 individual ha⁻¹ which comprises of 65.3% *Avicenia marina* and 34.7% *Rhizophora mucronata*, respectively. This vegetation was dominated by trees with diameter class of 5 to 9.9 cm with the average density of 3651 individual ha⁻¹. This area was planted with *Rhizophora mucronata* in a 2x2 distance on a 87 ha areas. The results shows that the average of the above ground carbon stock was 75.62 tonCha⁻¹, the below ground carbon stock 34.22 tonCha⁻¹, and in the mangrove substrate the carbon stock 180.55 tonCha⁻¹. As much as 62% of carbon in this area was stored in substrate, 26% of this carbon stock above ground, and the rest of it was below ground mangrove (roots). The intake of carbon dioxide (CO₂) was 88349.82 tonCO₂ with average of 1015.51 tonCO₂ha⁻¹.

Keywords: mangrove, allometric equation, C-organic, carbon stock

Student of Department of Forest Resource Conservation, Faculty of Forestry, Gadjah Mada University, Yogyakarta.