

**INVENTARISASI BIOMASA DAN KARBON BATANG, CABANG, DAUN  
DAN TUMBUHAN BAWAH DI HUTAN TANAMAN JATI  
KPH KEBONHARJO, PERUM PERHUTANI UNIT I JAWA TENGAH**

oleh :

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**INTISARI**

Hutan tanaman jati (*Tectona grandis* L.f.) mempunyai potensi secara ekologis sebagai penyimpan cadangan karbon dalam waktu yang panjang. Namun, data dan informasi tentang kandungan biomasa dan karbon seluruh sumber karbon di hutan jati khususnya pada kawasan kelola Perum Perhutani masih terbatas. Pengukuran biomasa dan karbon pada tegakan jati di atas permukaan tanah dan tumbuhan bawah perlu dilakukan secara akurat dalam rangka membangun sumber daya karbon hutan jati secara utuh sebagai bentuk dukungan pelaksanaan skema REDD+, yaitu suatu mekanisme internasional untuk memberikan kompensasi bagi negara berkembang yang berhasil mengurangi emisi dari deforestasi dan degradasi hutan, memasukkan aspek konservasi, mengelola hutan secara lestari dan meningkatkan cadangan karbon hutan

Penelitian ini bertujuan untuk menyusun persamaan allometrik dan nilai faktor perluasan biomasa (BEF) pada pohon jati di atas tanah serta menaksir potensi kandungan biomasa, karbon dan penyerapan CO<sub>2</sub> tegakan jati di atas tanah dan tumbuhan bawahnya. Penelitian dilakukan di wilayah KPH Kebonharjo, Perum Perhutani Unit I Jawa Tengah. Pengumpulan data dilakukan dengan metode *destructive sampling* dengan pemilihan sampel pohon dan tumbuhan bawah secara *purposive* dari kelas hutan produktif (KU I - KU VI). Analisis pengujian kadar karbon dilakukan melalui metode *walkley and black* dengan spektrofotometri. Penaksiran kandungan biomasa dan karbon tegakan jati dilakukan melalui pendekatan persamaan allometrik sedangkan untuk tumbuhan bawah melalui konversi luasan petak sampel ke dalam luasan tiap kelas umur.

Penelitian menghasilkan persamaan allometrik untuk menaksir kandungan biomasa dan karbon pohon di atas tanah adalah  $W_{ag} = 0,075.DBH^{2,627}$  (*adjusted R*<sup>2</sup> = 0,991) dan  $C_{ag} = 0,033.DBH^{2,635}$  (*adjusted R*<sup>2</sup> = 0,990). Nilai BEF pohon jati di atas tanah rata-rata sebesar 1,27 dengan nilai BEF pada umur 5; 10; 15; 20; 25; 30; 35; 41; 45; 50; 56; 60 tahun berturut-turut adalah 1,38; 1,33; 1,20; 1,21; 1,20; 1,30; 1,21; 1,21; 1,39; 1,36; 1,27; 1,21. Kandungan biomasa, karbon dan serapan CO<sub>2</sub> pada tegakan jati di atas tanah masing-masing sebesar 619.171,120 ton, 278.055,406 ton dan 1.019.536,49 ton, dengan potensi simpanan biomasa, karbon dan serapan CO<sub>2</sub> masing-masing sebesar 62,535 ton/ha, 28,083 ton/ha dan 102,97 ton/ha. Kandungan biomasa, karbon dan penyerapan CO<sub>2</sub> pada tumbuhan bawah masing-masing sebesar 57.662,593 ton, 20.727,437 ton dan 76.000,60 ton, dengan potensi simpanan biomasa, karbon dan serapan CO<sub>2</sub> masing-masing sebesar 6,181 ton/ha, 2,222 ton/ha dan 8,15 ton/ha.

Kata kunci : biomasa, karbon, jati, tumbuhan bawah, persamaan allometrik, faktor perluasan biomasa (BEF)

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**INVENTORY OF STEM, BRANCH, LEAF AND UNDERSTOREY  
BIOMASS AND CARBON ON TEAK PLANTATION  
IN KPH KEBONHARJO, PERUM PERHUTANI UNIT I CENTRAL JAVA**

by :

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**ABSTRACT**

Teak (*Tectona grandis* L.f.) plantation has an ecological potency as a carbon stock in a long time. However, data and information on biomass and carbon concentration of all carbon pools on teak forests, especially in Perum Perhutani management areas are limited. Aboveground biomass and carbon measurements from teak stand carried out accurately in order to fulfil establish teak forest carbon resource in should be support of implementation of REDD+ schemes. It is an international mechanism to compensate developing countries that successful in reducing emissions from deforestation and forest degradation, integrating aspects of conservation, managing forest sustainably and increasing forest carbon stocks.

This study was aimed to develop allometric equations and Biomass Expansion Factors (BEFs) value on the aboveground teak stands and to assess the potential stock of their aboveground and understorey biomass, carbon and CO<sub>2</sub> sequestration. The study area was located in KPH Kebonharjo, Perum Perhutani Unit I Central Java, Indonesian teak plantation. The data were collected by applying destructive sampling method which purposively selected the trees and understorey samples from the productive forest classes (KU I - KU VI). Analysis of the carbon concentration tested by using spectrophotometry with Walkley and Black method. The assessment of biomass and carbon concentration of teak stands was elaborated through allometric equation approach, while for understorey was conducted by converting the sample plot area into the mean age of each teak classes.

The results showed that the allometric equation to estimate aboveground trees biomass and carbon concentration was  $W_{ag} = 0.075.DBH^{2.627}$  (adjusted  $R^2 = 0.991$ ) and  $C_{ag} = 0.033.DBH^{2.635}$  (adjusted  $R^2 = 0.990$ ). BEF value of aboveground teak tree was 1.27 on average with BEF at age 5; 10; 15; 20; 25; 30; 35; 41; 45; 50; 56; 60 years are 1.38; 1.33; 1.20; 1.21; 1.20; 1.30; 1.21; 1.21; 1.39; 1.36; 1.27; 1.21 respectively. The concentration of biomass, carbon and CO<sub>2</sub> uptake in aboveground teak trees stand were 619,171.120 ton, 278,055.406 ton and 1,019,536.49 ton, with the potential stock of biomass, carbon and CO<sub>2</sub> absorption were 62.535 ton/ha, 28.083 ton/ha and 102.97 ton/ha. The concentration of biomass, carbon and CO<sub>2</sub> sequestration in understorey were 57,662.593 ton, 20,727.437 ton and 76,000.60 ton, with the potential stock of biomass, carbon and CO<sub>2</sub> absorption amounted to 6.181 ton/ha, 2.222 ton/ha and 8.15 ton/ha.

*Keywords : biomass, carbon, teak, understorey, allometric equation, biomass expansion factor (BEF)*

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