

**INVENTARISASI KANDUNGAN KARBON  
POHON PINUS (*Pinus merkusii* Jung. et de Vriese)  
BERDASARKAN DIAMETER BATANG**

Oleh:

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**RINGKASAN**

Pohon Pinus (*Pinus merkusii* Jung. et de Vriese) merupakan salah satu jenis pohon yang dibudidayakan di kawasan hutan negara termasuk di Perhutani Unit I Jawa Tengah. Oleh karena itu perlu dilakukan penelitian lebih lanjut bahwa pohon pinus memiliki nilai ekonomi tidak hanya dari nilai getahnya saja tetapi juga sebagai penyedia jasa lingkungan melalui penyerapan karbon.

Metode pengambilan data pada penelitian ini dimulai dengan penebangan pohon sampel dan tiap-tiap organ pohon dipisahkan (batang, cabang, dan daun). kemudian tiap-tiap organ ditimbang untuk mengetahui berat basahanya. Selanjutnya masing-masing organ diambil sampel secukupnya untuk dianalisis kandungan biomassa dan kandungan karbonnya. Kandungan biomassa setiap organ diperoleh setelah sampel dioven dengan suhu  $103 \pm 2^\circ\text{C}$  sampai diperoleh berat kering tanur dari sampel. Untuk kandungan karbon setiap organ diperoleh setelah dilakukan proses pengarangan dengan suhu  $400^\circ\text{C}$ , uji kadar air arang dengan suhu  $103 \pm 2^\circ\text{C}$ , uji kadar zat menguap dengan suhu  $900^\circ\text{C}$ , uji kadar abu dengan suhu  $600^\circ\text{C}$  dan uji kadar karbon terikat.

Dari hasil penelitian diperoleh rata-rata kandungan karbon pada organ batang 50,733 kg/pohon (89,03%), cabang 5,242 kg/pohon (9,19%) dan daun 1,007 kg/pohon (1,76%). Dari hasil analisis diperoleh hubungan antara diameter batang dengan kandungan karbon tiap organ dalam persamaan allometrik sebagai berikut :  $C_{\text{batang}} = 0,0036D^{2,8454}$  ( $R^2=0,9513$ ),  $C_{\text{cabang}} = 0,0061D^{2,0674}$  ( $R^2=0,9322$ )  $C_{\text{daun}} = 0,1276D^{0,6410}$  ( $R^2=0,3978$ ),  $C_{\text{total}} = 0,0109D^{2,5659}$  dengan ( $R^2=0,9634$ ). Persamaan allometrik  $C_{\text{total}} = 0,0109D^{2,5659}$  diterapkan untuk mengestimasi potensi kandungan karbon di KPH Kedu Utara diperoleh kandungan karbon rata-rata sebesar 21,006 ton/ha.

Kata Kunci : Pohon pinus, diameter batang, karbon, persamaan allometrik

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## THE CONTENT INVENTORY OF PINE TREES CARBON (*Pinus merkusii* Jung. et de Vriese) BASED ON STEM DIAMETER

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### ABSTRACT

Pine tree is one of the several types of tree which is cultivated in state forest area including Perhutani Unit I Central Java. For that reason, and advanced research is needed to investigate that pine tree does not only consist of economical value (its resin) but it is also valuable to absorb carbon in environmental circumstances.

This study applied several methods of data collection, the first step was to cut down the tree and classify each organ of the tree (stem, branch, and leaf). The second step was to measure the fresh weight of the organs, each organ was taken sufficiently to be analysed its biomass and carbon substance. The biomass of each organ was obtained after the samples were dried in oven at  $103 \pm 2$  °C until reached dry weight. Meanwhile, the carbon was obtained by applying carbonization process at 400 °C, water charcoal test at  $103 \pm 2$  °C, volatile matter test at 900 °C, sawdust substance test at 600 °C, and attached carbon substance test.

From the result of this research, it was found that the average carbon content in stem 50,733 kg/tree (89,03%), branches 5,242 kg/tree (9,19%) and leaf 1,007 kg/tree (1,76%). From the result of the analysis was obtained the relationship between stem diameter and carbon content in allometric equations as follows  $C_{\text{stem}} = 0,0036 D^{2,8454}$  ( $R^2 = 0,9513$ ),  $C_{\text{branches}} = 0,0061 D^{2,0674}$  ( $R^2 = 0,9322$ ),  $C_{\text{leaves}} = 0,1276 D^{0,6410}$  ( $R^2 = 0,3978$ ),  $C_{\text{total}} = 0,0109 D^{2,5659}$  ( $R^2 = 0,9634$ ). Allometric equations  $C_{\text{total}} = 0,0109 D^{2,5659}$  was applied to estimate carbon content in KPH Kedu Utara and we obtained the average carbon content was 21,006 ton/ha.

Key words: pine trees, stem diameter, carbon, allometric equations

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