

Kandungan dan Akumulasi C-Organik Tanah pada Beberapa Jenis Tegakan di KHDTK Wanagama I, Gunungkidul

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INTISARI

Penyimpanan karbon terbesar di darat berada di dalam tanah dengan bentuk C-Organik. Perbedaan jenis tegakan dan kondisi lingkungan dapat memengaruhi besarnya kandungan C-Organik pada tanah. Jumlah kandungan karbon yang tersimpan di tanah hutan dapat digunakan untuk menduga besarnya penyerapan karbon dioksida (CO₂) oleh tumbuhan. Peningkatan kandungan karbon dioksida (CO₂) menyebabkan terjadinya perubahan iklim, salah satunya diakibatkan oleh deforestasi dan degradasi lahan hutan. Upaya yang dapat dilakukan untuk menanggulangi perubahan iklim adalah rehabilitasi lahan. KHDTK Wanagama I merupakan kawasan kritis yang telah berhasil direhabilitasi. Penelitian ini dilakukan untuk mengetahui kandungan dan akumulasi C-Organik tanah pada beberapa jenis tegakan di KHDTK Wanagama I.

Pengumpulan data sampel tanah dilakukan pada 4 tegakan di KHDTK Wanagama I, yaitu tegakan *A. mangium* umur 28 tahun di petak 14, tegakan *Eucalyptus sp.* umur 21 tahun di petak 18, tegakan *Swietenia macrophylla* umur 70 tahun di petak 16, dan tegakan *Gliricidia sepium* umur 57 tahun di petak 5. Sampel tanah pada tiap tegakan berjumlah 18 yang terdiri dari tanah terusik dan tidak terusik. Pengukuran data kadar C-Organik tanah dilakukan dengan metode *walkley and black* dan pengukuran akumulasi C-Organik tanah dilakukan dengan mengukur berat volume tanah dan berat tanah per hektare. Analisis data dilakukan menggunakan analisis ragam (*Analysis of Variance/ANOVA*). Apabila jenis tegakan dan lapisan tanah berpengaruh nyata maka dilanjutkan dengan uji lanjutan *Duncan's Multiple Range Test* (DMRT) pada taraf uji 5%.

Hasil penelitian menunjukkan bahwa kandungan C-Organik tanah di KHDTK Wanagama I pada Tegakan *A. mangium* sebesar 3,58%, Tegakan *Eucalyptus sp.* sebesar 3,31%, Tegakan *Swietenia macrophylla* 4,30%, dan Tegakan *Gliricidia sepium* 5,69%. Berat Volume tanah pada Tegakan *A. mangium* sebesar 1,01 g/cm³, Tegakan *Eucalyptus sp.* sebesar 1,05 g/cm³, Tegakan *Swietenia macrophylla* sebesar 1,04 g/cm³, dan Tegakan *Gliricidia sepium* sebesar 1,03 g/cm³. Nilai akumulasi kandungan C-Organik tanah pada Tegakan *A. mangium* 105,61 ton/ha, Tegakan *Eucalyptus sp.* 103,98 ton/ha, Tegakan *Swietenia macrophylla* 129,61 ton/ha, dan Tegakan *Gliricidia sepium* 175,85 ton/ha. Perbedaan tegakan dan kedalaman lapisan tanah berpengaruh secara signifikan terhadap kandungan dan akumulasi C-Organik tanah. Penggunaan lahan dengan menjaga produktivitas tanah perlu dilakukan agar tidak menyebabkan penurunan kandungan C-Organik tanah.

Kata Kunci: C-Organik Tanah, Perubahan Iklim, KHDTK Wanagama I, *Acacia mangium*, *Eucalyptus sp.*, *Swietenia macrophylla*, *Gliricidia sepium*.

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Soil Organic C-Content and Accumulation in Several Types of Stands in KHDTK Wanagama I, Gunungkidul

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ABSTRACT

The largest carbon storage on land is in the soil in the C-Organic form. Different types of stands and environmental conditions can affect the amount of C-Organic content in the soil. The amount of carbon stored in forest soil can be used to estimate the amount of carbon dioxide (CO₂) absorption by plants. The increase in carbon dioxide (CO₂) content causes climate change, one of which is caused by deforestation and forest land degradation. Efforts that can be made to tackle climate change is land rehabilitation. KHDTK Wanagama I is a critical area that has been successfully rehabilitated. This study aims to determine the content and accumulation of C-Organic soil in several types of stands in KHDTK Wanagama I.

Soil sample data were collected from 4 stands in KHDTK Wanagama I, namely *Acacia mangium* 28 years old in plot 14, *Eucalyptus sp.* 21 years old in plot 18, *Swietenia macrophylla* 70 years old in plot 16, and *Gliricidia sepium* 57 years old in plot 5. There were 18 soil samples in each stand consisting of disturbed and undisturbed soils. Measurement of soil C-Organic content was carried out by using the walkley and black method and measurement of soil C-Organic accumulation was carried out by measuring soil unit weight and soil weight per hectare. Data analysis was performed using analysis of variance (ANOVA). If the type of stand and soil layers have a significant effect, then continue with the Duncan's Multiple Range Test (DMRT) test at a test level of 5%.

The results showed that the C-Organic content of the soil in KHDTK Wanagama I in *A. mangium* stands was 3.58%, *Eucalyptus sp.* stands were 3.31%, *Swietenia macrophylla* stands were 4.30%, and *Gliricidia sepium* stands were 5.69%. Soil volume weight in *A. mangium* stands was 1.01 g/cm³, *Eucalyptus sp.* stands was 1.05 g/cm³, Mahogany stands were 1.04 g/cm³, and *Gliricidia sepium* stands were 1.03 g/cm³. The accumulated value of soil C-Organic content in *Acacia* stands was 105.61 tons/ha, *Eucalyptus* stands were 103.98 tons/ha, *Swietenia macrophylla* stands were 129.61 tons/ha, and *Gliricidia sepium* stands were 175.85 tons/ha. The difference in stands and the depth of the soil layer has a significant effect on the content and accumulation of soil C-Organic. Land use by maintaining soil productivity needs to be done so as not to cause a decrease in soil C-Organic content.

Keywords: C-Organic Soil, Climate Change, KHDTK Wanagama I, *Acacia mangium*, *Eucalyptus sp.*, *Swietenia macrophylla*, *Gliricidia sepium*.

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