

**PENGARUH BIOGEOFISIK TERHADAP SIMPANAN KARBON HUTAN  
RAKYAT JATI DESA PACAREJO GUNUNGKIDUL,  
DAERAH ISTIMEWA YOGYAKARTA**

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**INTISARI**

Hutan rakyat dapat menjadi tempat penyimpanan karbon yang potensial, terutama di tengah krisis iklim global. Kabupaten Gunungkidul menjadi kabupaten dengan luasan hutan rakyat tertinggi di Provinsi Daerah Istimewa Yogyakarta. Tegakan jati yang umum dibudidayakan oleh masyarakat berpotensi menyimpan karbon melalui biomassa dan tanah. Oleh karena itu, penelitian ini bertujuan untuk mengkaji seberapa besar hutan rakyat dapat menyimpan karbon dan faktor-faktor biogeofisik apa saja yang memengaruhi simpanan karbon.

Penelitian dilaksanakan di Hutan Rakyat milik PT Lintang Jati Kencana Desa Pacarejo yang ditanami *Tectona grandis* dan tersebar pada 7 dusun. Pengambilan sampel tanah untuk analisis *soil organic carbon* dilakukan baik secara terusik maupun tidak terusik pada kedalaman 0-20 cm, sementara itu pendugaan biomassa dilakukan secara *non-destructive* menggunakan persamaan allometrik pada 30 plot ukur berbentuk lingkaran dengan luas 0.04 ha. Analisis pengaruh biogeofisik terhadap simpanan karbon menggunakan analisis regresi linear berganda.

Berdasarkan analisis data yang telah dilakukan, diperoleh potensi biomassa tegakan jati sebesar 32,1 ton/ha, simpanan karbon 15,09 ton C/ha, serapan CO<sub>2</sub> sebesar 55,37 ton/ha, dan produksi O<sub>2</sub> 40,25 ton/ha. Nilai simpanan karbon ini tergolong rendah. Sementara itu, karbon organik tanah tercatat sebesar 52,63 ton/ha. Secara simultan, variabel biogeofisik berpengaruh secara signifikan terhadap simpanan karbon. Namun, secara parsial hanya DBH, kerapatan tegakan, dan kandungan C-organik tanah yang menunjukkan pengaruh signifikan.

Kata Kunci: *Tectona grandis*, hutan rakyat, karbon organik tanah, biomassa, simpanan karbon, serapan CO<sub>2</sub>, produksi O<sub>2</sub>, biogeofisik

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**BIOGEOPHYSICAL INFLUENCES ON CARBON STORAGE IN TEAK  
COMMUNITY FOREST OF PACAREJO VILLAGE GUNUNGKIDUL,  
SPECIAL REGION OF YOGYAKARTA**

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***ABSTRACT***

*Community forest can be a potential carbon sink, especially in the context of the global climate crisis. Gunungkidul Regency has the highest area of community forest in Special Region of Yogyakarta. The teak stands that is commonly cultivated by the community has the potential to store carbon through biomass and soil. Therefore, this study aims to assess how much community forest can store carbon and what biogeophysical factors affect carbon storage.*

*The research was conducted in the community forest owned by PT Lintang Jati Kencana, Pacarejo Village, which is planted with *Tectona grandis* and spread out across 7 hamlets. Soil sampling for soil organic carbon analysis was carried out both disturbed and undisturbed at a depth of 0-20 cm, while biomass estimation was carried out non-destructively using the allometric equation on 30 circular measuring plots with an area of 0,04. Biogeophysical factors influencing carbon storage were analyzed using multiple linear regression.*

*Based on the data analysis, the potential biomass of teak stands was 32,1 tons/ha, carbon storage 15,09 tons C/ha, carbon dioxide sequestration was 55,37 tons/ha, and O<sub>2</sub> production was 40,25 tons/ha. This carbon storage value is relatively low. Meanwhile, soil organic carbon was recorded at 52,63 ton/ha. Simultaneously, biogeophysical variables significantly influenced carbon storage. However, partially only DBH, stand density, and soil carbon organic carbon production were significant.*

*Keywords: *Tectona grandis*, community forest, soil organic carbon, biomass, carbon storage, CO<sub>2</sub> sequestration, O<sub>2</sub> production, biogeophysical*

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