

**SIMPANAN DAN NILAI EKONOMI KARBON AGROFORESTRI PINUS-  
KAPULAGA DI RPH SAMUDRA, BKPH LUMBIR,  
KPH BANYUMAS BARAT**

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**INTISARI**

Hutan tanaman yang dikembangkan dengan sistem agroforestri mempunyai banyak manfaat, salah satunya adalah dapat mengurangi konsentrasi gas karbondioksida (CO<sub>2</sub>) di atmosfer melalui proses fotosintesis. Penelitian ini bertujuan untuk mengetahui simpanan biomasa dan karbon serta nilai ekonomi serapan gas karbondioksida pada sistem agroforestri pinus-kapulaga di RPH Samudra, BKPH Lumbir KPH Banyumas Barat.

Penelitian dilakukan di hutan tanaman agroforestri pinus-kapulaga Perum Perhutani RPH Samudra, BKPH Lumbir, KPH Banyumas Barat dari kelas umur (KU) III-VI yang tersebar di 6 buah anak petak yaitu anak petak 37A, B, C, D, E dan 37F dengan luas baku total 116,9 ha. Pendugaan biomassa tegakan pinus dilakukan secara *non-destructive* menggunakan total 30 buah plot ukur berbentuk lingkaran dengan luas plot 0,04 ha untuk KU III-IV dan luas plot 0,1 ha untuk KU V-VI. Persamaan alometrik yang digunakan adalah persamaan allometrik dari Siregar (2007) yaitu  $Bt = 0,0963(dbh)^{2,4323}$ .

Kadar karbon dari biomassa menggunakan angka 47% seperti yang disarankan didalam (SNI 7724, 2011) dan serapan CO<sub>2</sub> dihitung dengan mengalikan angka 3,67 dari simpanan karbonnya. Nilai ekonomi serapan CO<sub>2</sub> dihitung dengan pendekatan metode *benefit transfer*. Metode destruktif dilakukan untuk tanaman kapulaga yang ditanam di bawah tegakan pinus tersebut untuk mendapatkan biomasa total dari organ akar, batang, daun dan buah.

Hasil penelitian menunjukkan bahwa potensi biomassa dan simpanan karbon di RPH Samudra berturut-turut sebanyak 76.130,931 ton dan 35.781,637 ton, sedangkan nilai ekonomi serapan gas CO<sub>2</sub> pada agroforestri pinus-kapulaga tersebut senilai \$ 893.325,94 atau setara dengan Rp 13.823.012.855,13. Hasil penelitian ini menunjukkan bahwa pengembangan agroforestri pinus-kapulaga di RPH Samudra berpeluang untuk dipertimbangkan dalam perdagangan karbon dunia.

*Kata kunci : Biomassa, karbon, agroforestri, tanaman kapulaga, tegakan pinus, nilai ekonomi*

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**THE CARBON STORAGE AND ECONOMIC VALUE OF PINE-CARDAMOM AGROFORESTRY IN RPH SAMUDRA, BKPH LUMBIR, KPH BANYUMAS BARAT**

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**ABSTRACT**

Plantation forest developed with an agroforestry system has many benefits, one of which is to reduce the concentration of carbon dioxide (CO<sub>2</sub>) gas in the atmosphere through the photosynthesis process. This study aims to determine the biomass and carbon storage as well as the economic value of carbon dioxide gas absorption in the pine-cardamom agroforestry system in RPH Samudra, BKPH Lumbr KPH Banyumas Barat.

The research was conducted in the pine-cardamom agroforestry plantation forest of Perum Perhutani RPH Samudra, BKPH Lumbr, KPH Banyumas Barat from age class (KU) III-VI spread in 6 subplots which are plot 37A, B, C, D, E, and 37F with a total standard area of 116,9 ha. Non-destructive estimation of pine stand biomass was conducted using a total of 30 circle measuring plots with a plot area of 0,04 ha for KU III-IV and a plot area of 0,1 ha for KU V-VI. The allometric equation used is the allometric equation from Siregar (2007), namely  $Bt = 0,0963(dbh)^{2,4323}$

The carbon content of the biomass is 47% as suggested in (SNI 7724, 2011), and CO<sub>2</sub> sequestration is calculated by multiplying 3,67 by the carbon storage. The economic value of CO<sub>2</sub> sequestration was calculated using the benefit transfer method approach. The destructive method was conducted for cardamom plants grown under the pine plantation to obtain the total biomass of the root, stem, leaf, and fruit organs.

The results showed that the potential biomass and carbon storage in RPH Samudra was 76.130,931 tons and 35.781,637 tons, respectively, while the economic value of CO<sub>2</sub> gas absorption in the pine-cardamom agroforestry was \$893.325,94 or equivalent to Rp.13.823.012.855,13. The results showed that the development of pine-kapulaga agroforestry in RPH Samudra has the opportunity to be considered for global carbon trading.

*Keyword: Biomass, carbon, agroforestry, cardamom plants, pinus tree, economic value.*

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