Potensi Simpanan Karbon di Berbagai Gradien Elevasi Kawasan Hutan Desa Dayurejo, Pasuruan, Jawa Timur

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INTISARI

Pegunungan Arjuno-Welirang memiliki keanekaragaman hayati yang kompleks. Salah satu kawasan hutan di Pegunungan Arjuno-Welirang yaitu Hutan Desa Dayurejo berada pada ketinggian 455–1.536 mdpl yang terdiri dari hutan alam dan hutan tanaman. Wilayah ini menjadi sistem eksperimental alami untuk mengungkap struktur dan komposisi tegakan serta potensi simpanan karbon sebagai fungsi perubahan elevasi. Oleh karena itu, tujuan dari penelitian ini yaitu membandingkan, menghitung, dan menjelaskan struktur komposisi tegakan berdasarkan INP, potensi biomassa, pola stok karbon, dan serapan CO_2 di berbagai gradien elevasi Hutan Desa Dayurejo.

Sampel dibagi ke dalam tiga gradien elevasi yaitu elevasi rendah (455–815 mdpl), elevasi sedang (816–1.176 mdpl), dan elevasi tinggi (1.177–1.536 mdpl). Struktur dan komposisi tegakan diketahui dari nilai INP. Pengukuran biomassa dilakukan dengan metode *non-destructive sampling*. Pendugaan biomassa menggunakan persamaan allometrik setiap spesies yang ada. Pendugaan karbon dari biomassa menggunakan angka 47% sesuai dengan SNI 7724 (2019) dan serapan CO_2 dihitung dengan mengalikan angka konversi 3,67 dari simpanan karbon yang diperoleh.

Tingkat pertumbuhan semai, pancang, tiang, dan pohon di masing-masing gradien elevasi memiliki spesies dominan yang berbeda. Tingkat pohon didominasi oleh *Pinus merkusii* pada elevasi rendah dan sedang dengan INP 134,86% dan 139,161%; pada elevasi tinggi didominasi *Lithocarpus elegans* dengan INP 164,743%. Spesies dominan juga menjadi kontributor utama dalam potensi biomassa, stok karbon, dan serapan CO_2 pada setiap elevasi. Potensi tertinggi pada elevasi rendah, disusul elevasi sedang, dan elevasi tinggi dengan total stok karbon 51,132 ton/ha. Pola stok karbon berbanding terbalik dengan gradien elevasi, dimana seiring meningkatnya elevasi maka stok karbon semakin menurun.

Kata kunci: stok karbon, pegunungan, gradien elevasi

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POTENTIAL CARBON STORAGE IN VARIOUS ELEVATION GRADIENTS OF DAYUREJO VILLAGE FOREST AREA, PASURUAN, EAST JAVA

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ABSTRACT

The Arjuno-Welirang Mountains have complex biodiversity. One of the forest areas in the Arjuno-Welirang Mountains is Dayurejo Village Forest, which is located at an altitude of 455–1.536 masl and it consists of natural forests and plantation forests. This area becomes a natural experimental system to uncover the structure and composition of stands as well as the potential for carbon storage as a function of elevation changes. Therefore, the purpose of this study is to compare, calculate, and explain the structure of stand composition based on INP, biomass potential, carbon stock patterns, and CO_2 absorption in various elevation gradients of Dayurejo Village Forest.

The sample was divided into three elevation gradients: low elevation (455–815 masl), medium elevation (816–1.176 masl), and high elevation (1.177–1.536 masl). The structure and composition of the stand are known from the INP value. Biomass measurements were carried out by *non-destructive sampling methods.* Biomass estimation were used the allometric equation of each existing species. The estimate of carbon from biomass were used the figure of 47% in accordance with SNI 7724 (2019) and the CO_2 absorption is calculated by multiplying the conversion figure of 3,67 from the carbon store obtained.

The growth rates of seedlings, saplings, poles, and trees in each elevation gradient have different dominant species. Tree levels are dominated by *Pinus merkusii* at low and medium elevations with INP 134,86% and 139,161%; at high elevations dominated by *Lithocarpus elegans* with INP 164,743%. Dominant species are also major contributors to biomass potential, carbon stocks, and CO_2 absorption at each elevation. The highest potential is at low elevation, followed by medium elevation, and high elevation with a total carbon stock of 51,132 tons/ha. The pattern of carbon stocks is inversely proportional to the elevation gradient, where as the elevation increases, the carbon stock decreases.

Keywords: carbon stock, mountains, elevation gradient

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