

Estimasi Volume Batang Bebas Cabang dan Biomassa Genus *Shorea* di Hutan Tropis Basah PT Sari Bumi Kusuma Kalimantan Tengah

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Hutan tropis yang dikelola oleh PT Sari Bumi Kusuma memegang peranan penting dalam menstabilkan iklim global. Disisi lain, pemanfaatan hutan untuk produksi kayu dapat mengakibatkan berkurangnya stok karbon dalam biomassa tegakan. Penelitian ini bertujuan untuk menyusun persamaan allometrik pendugaan volume batang pohon, persentase biomassa berbagai komponen pohon, mengetahui potensi volume batang bebas cabang dan biomassa pohon terutama dari genus *shorea* di areal hutan bekas tebangan (*logged over area*, LOA), baik yang dikelola dengan sistem silvikultur Tebang Pilih Tanam Jalur (TPTJ) maupun tanpa perlakuan (non TPTJ) di hutan tropis PT Sari Bumi Kusuma.

Metode pengukuran volume dan biomassa pohon dilakukan dengan cara penebangan (*destructive sampling*). Pengukuran volume batang diawali dengan penebangan pohon, selanjutnya dipotong menjadi beberapa segmen, dan diukur volume batangnya untuk tiap-tiap segmen. Pengukuran biomassa dilakukan dengan penimbangan berat basah total untuk tiap-tiap organ tanaman (batang, cabang, daun, akar). Pengambilan sampel dari berat basahnya dilakukan di lapangan selanjutnya dikeringkan dengan oven sampai mencapai berat konstan (biomassa).

Hasil penelitian ini menunjukkan bahwa persamaan allometrik yang menyatakan hubungan antara volume batang bebas cabang (V_k) dengan biomasanya (W_k) adalah sebagai berikut:

$$W_k = 273,021(V_k)^{0,998} ; R^2 = 0,954, \text{ genus } shorea, \text{ TPTJ}$$

$$W_k = 527,527(V_k)^{1,009} ; R^2 = 0,963, \text{ genus campuran, TPTJ}$$

$$W_k = 626,245(V_k)^{0,900} ; R^2 = 0,965, \text{ genus } shorea, \text{ non TPTJ}$$

$$W_k = 527,527(V_k)^{1,009} ; R^2 = 0,963, \text{ genus campuran, non TPTJ}$$

Berdasarkan persamaan allometrik yang diperoleh, selanjutnya digunakan untuk menghitung potensi volume batang bebas cabang dan biomasanya dari data hasil inventarisasi 6 buah Petak Ukur Permanen (PUP) yang luasnya masing-masing 1 hektar. Hasil penghitungan potensi volume batang bebas cabang (V_k) dan biomasanya (W_k) adalah sebagai berikut:

$$V_k = 68,324 \text{ m}^3/\text{ha} (50,02\%) ; \text{ genus } shorea, \text{ TPTJ}$$

$$V_k = 136,607 \text{ m}^3/\text{ha} ; \text{ genus campuran, TPTJ}$$

$$V_k = 72,028 \text{ m}^3/\text{ha} (36,08\%) ; \text{ genus } shorea, \text{ non TPTJ}$$

$$V_k = 199,612 \text{ m}^3/\text{ha} ; \text{ genus campuran, non TPTJ}$$

$$W_k = 18,583 \text{ ton/ha} (25,74\%) ; \text{ genus } shorea, \text{ TPTJ}$$

$$W_k = 72,183 \text{ ton/ha} ; \text{ genus campuran, TPTJ}$$

$$W_k = 39,093 \text{ ton/ha} (36,98\%) ; \text{ genus } shorea, \text{ non TPTJ}$$

$$W_k = 105,712 \text{ ton/ha} ; \text{ genus campuran, non TPTJ}$$

Hasil penelitian juga menunjukkan bahwa potensi biomassa yang sementara ini tidak dimanfaatkan oleh perusahaan (akar, cabang, daun dan ujung batang non bebas cabang) berkisar 60% dari total biomassa pohon untuk areal TPTJ dan berkisar 40% dari total biomassa pohon untuk areal non TPTJ.

Kata kunci: volume batang bebas cabang, biomassa, allometrik, TPTJ, LOA

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Volume Estimation of Free Branch's Stem and Genus of Shorea's Biomass in Tropical Rainforest PT Sari Bumi Kusuma Central Borneo

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ABSTRACT

Tropical forest which managed by PT Sari Bumi Kusuma occupied an important part to stabilize global climate. Otherwise, forest utilization for wood production can cause decreasing of carbon stock in stands' biomass. This research aims to arrange allometric equations of stem volume estimation, biomass percentage of tree components, figure out the potency of free branch's stem volume and tree's biomass especially from the genus Shorea in Logged Over Area (LOA), whether managed by strip clearing and replanting silvicultural system (known as TPTJ) or without treatment (non strip clearing and replanting) in tropical forest of PT Sari Bumi Kusuma.

The measurement method of tree's volume and biomass was conducted by destructive sampling. Stem's volume measurement started with trees' logging, then cut into several segments, and measuring the stem's volume for each segment. Biomass measurement was conducted by total wet weight scaling for each plant organ (stem, branch, leaf, root). Wet weight sampling conducted on the field, further dried in an oven until reached the constant weight (biomass).

Result of this research shows that allometric equations which indicated relation between branch-free stem's volume (V_k) with the biomass (W_k) are as follows:

$$W_k = 273,021(V_k)^{0,998} \quad ; R^2 = 0,954, \text{ genus of } shorea, \text{ TPTJ}$$

$$W_k = 527,527(V_k)^{1,009} \quad ; R^2 = 0,963, \text{ mixed genus, TPTJ}$$

$$W_k = 626,245(V_k)^{0,900} \quad ; R^2 = 0,965, \text{ genus of } shorea, \text{ non TPTJ}$$

Based on the result of allometric equations, then have been used for calculate the potency of branch-free stem's volume and these biomass from 6 permanent plots measurement inventory result data, which extent of 1 hectare for each plot. Result of branch-free stem's volume potency (V_k) and these biomass (W_k) are as follows:

$$V_k = 68,324 \text{ m}^3/\text{ha} \text{ (50,02\%)} \quad ; \text{ genus of } shorea, \text{ TPTJ}$$

$$V_k = 136,607 \text{ m}^3/\text{ha} \quad ; \text{ mixed genus, TPTJ}$$

$$V_k = 72,028 \text{ m}^3/\text{ha} \text{ (36,08\%)} \quad ; \text{ genus of } shorea, \text{ non TPTJ}$$

$$V_k = 199,612 \text{ m}^3/\text{ha} \quad ; \text{ mixed genus, non TPTJ}$$

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$$W_k = 39,093 \text{ ton/ha} \text{ (36,98\%)} \quad ; \text{ genus of } shorea, \text{ non TPTJ}$$

$$W_k = 105,712 \text{ ton/ha} \quad ; \text{ mixed genus, non TPTJ}$$

Result of the research also shows that biomass potency that not in used temporary by the company (root, branch, leaf and tip of non branch-free stem) is around 60% from total of tree biomass for strip clearing and replanting area and revolved 40% from total of tree's biomass for non strip clearing and replanting area.

Key word: branch-free stem's volume, biomass, allometric, TPTJ, Logged Over Area

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