PERBANDINGAN EFISIENSI TEKNIK *TREE SAMPLING* DAN *PLOT SAMPLING* DALAM INVENTARISASI TEGAKAN KTHKm WONO MAKMUR DESA GONDANGLEGI KABUPATEN BOYOLALI

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INTISARI

Pelaksanaan Inventarisasi hutan sering dihadapkan pada keterbatasan waktu, biaya, serta tenaga pelaksana sehingga diperlukan teknik inventarisasi yang mampu menghasilkan data yang representatif namun tetap efisien dalam pelaksanaannya. Berbagai teknik inventarisasi, seperti *plot sampling* dan *tree sampling* memiliki karakteristik yang berbeda dalam tingkat kecermatan hasil, kebutuhan waktu pelaksanaan, dan kebutuhan biaya pelaksanaan. Penelitian ini dilakukan untuk membandingkan dan menganalisis tingkat kecermatan serta efisiensi teknik *tree sampling* dan *plot sampling* dalam inventarisasi hutan berdasarkan aspek biaya tenaga kerja dan waktu pelaksanaan dalam mengestimasi potensi kayu di areal kerja KTHKm Wono Makmur.

Penelitian ini menggunakan pendekatan eksperimental berbasis simulasi pada 55 petak ukur untuk membandingkan dan menganalisis teknik *plot sampling* dan *tree sampling* dengan variasi jarak sampling. Simulasi dilakukan menggunakan *systematic sampling with random start* dengan jarak sampling 100 x 100 m, 100 x 200 m, dan 200 x 200 m. *Plot sampling* menggunakan petak ukur seluas 0,02 Ha, sedangkan *tree sampling* menggunakan 3, 5, dan 6 pohon terdekat dari titik pusat. Data hasil pengukuran dianalisis presisi volume/ha, efisiensi relatif, dan biaya tenaga kerja dalam kegiatan inventarisasi.

Hasil penelitian menunjukkan bahwa *tree sampling* secara umum lebih efisien dibandingkan *plot sampling* pada seluruh jarak sampling. *5-tree sampling* dengan jarak 100 x 100 m menghasilkan kinerja paling seimbang dengan presisi 14,96% serta efisiensi relatif 9,68. Selain itu, *5-tree sampling* jarak 100 x 100 m mampu menekan biaya tenaga kerja 91% dibandingkan *plot sampling* jarak 100 x 100 m.

Kata Kunci : Inventarisasi Hutan, *Tree Sampling*, *Plot Sampling*, Efisiensi sampling.

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COMPARATION OF THE EFFICIENCY OF TREE SAMPLING AND PLOT SAMPLING TECHNIQUES IN THE STANDS INVENTORY OF WONO MAKMUR COMMUNITY FOREST IN GONDANGLEGI VILLAGE, BOYOLALI REGENCY

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ABSTRACT

Forest inventory implementation is often faced with limitations in terms of time, cost, and manpower, thus requiring inventory techniques that can produce representative data while remaining efficient in implementation. Various inventory techniques, such as plot sampling and tree sampling, have different characteristics in terms of accuracy, time required for implementation and cost. This study was conducted to compare and analyse the accuracy and efficiency of tree sampling and plot sampling techniques in forest inventory, based on labour costs and the time required to estimate timber potential within the operational area of the Wono Makmur Community Forest Management Unit (KTHKm).

This study employed a simulation-based experimental approach across 55 sample plots to compare and analyse plot sampling and tree sampling techniques with varying sampling distances. The simulations were conducted using systematic sampling with a random start, with sampling distances of 100 x 100 m, 100 x 200 m, and 200 x 200 m. Plot sampling utilised sample plots of 0.02 ha, whilst tree sampling utilised the 3, 5, and 6 nearest trees from the centre point. The measurement data were analysed for volume precision per hectare, relative efficiency, and labour costs in the inventory activities.

The results of the study indicate that tree sampling is generally more efficient than plot sampling across all sampling distances. 5-tree sampling at a 100 x 100 m produced the most balanced performance, with a precision of 14.96% and a relative efficiency of 9.68. Furthermore, 5-tree sampling at a 100 x 100 m reduces labour costs by 91% compared to plot sampling at a 100 x 100 m.

Keywords : Forest Inventory, Tree Sampling, Plot Sampling, Sampling Efficiency.

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