STUDI KOMPARASI PENERAPAN FUNGSI WEIBULL DAN FUNGSI BETA PADA SEBARAN DIAMETER SETINGGI DADA TEGAKAN JATI *(Tectona grandis L.f)* DI WILAYAH PERUN PERHUTANI UNIT I JAWA TENGAH

INTISARI

Pengelolaan hutan lestari dapat dicapai melalui sistem pengaturan hasil hutan yang tepat. Penerapan sistem pengaturan hasil hutan yang tepat membutuhkan ketersediaan informasi dasar tentang dinamika tegakan. Dinamika tegakan dapat digambarkan melalui distribusi diameter. Beberapa penelitian mengenai informsai dasar tentang dinamika tegakan telah dilaksanakan pada tegakan jati di Jawa. Hasil penelitian menyatakan bahwa fungsi Weibull dan fungsi Beta cukup baik untuk menggambarkan distribusi diameter tegakan jati.

Penelitian ini dilaksanakan untuk mengamati lebih lanjut mengenai model distribusi diameter yang didasarkan pada fungsi Weibull dan fungsi Beta. Kedua fungsi ini diterapkan pada 49 petak ukur kelas umur I – VII di 6 KPH (Kesatuan Pemangkuan Hutan) Jawa Tengah. Diameter pohon masing-masing petak ukur diukur dan dipetakan secara matematis. Fungsi Weibull dan Beta digunakan sebagai model dasar untuk masing-masing petak ukur yang kemudian diuji dengan menggunakan kaidah Kolmogorov-Smirnov.

Hasil penelitian menyatakan bahwa fungsi Beta lebih sesuai dibanding fungsi Weibull. Uji Kolmogorov-Smirnov pada tingkat signifikansi 5% dan 1% menunjukkan ada 4 petak ukur yang signifikan. Sementara itu, fungsi Weibull dengan dasar perhitungan persentil ke-17 dan 97 terdapat 9 petak ukur yang signifikan pada tingkat signifikansi 5% dan 5 petak ukur pada tingkat signifikansi 1%. Sedangkan dengan dasar perhitungan persentil ke-40 dan 82 terdapat 8 petak ukur signifikan pada tingkat signifikansi 5% dan 7 petak ukur pada tingkat signifikasi 1%. Berdasarkan distribusi diameter fungsi Beta dapat disusun model penduga distribusi diameter, yaitu : $\phi mak = 8.589 + (1.061*\phi rata)$, $\phi min = -4.667 + (0.863*\phi rata)$, $Var\text{-}D = -21.649 + (1.717*\phi mak) + (2.296*\phi min) + (0.716*\phi rata) + (0.0003306*N)$, dengan ϕmax = diameter maksimal, ϕmin diameter minimal, $\phi rata$ = diameter rata-rata, and $Var\text{-}D$ = varians diameter.

Kata kunci : dinamika tegakan, distribusi diameter, fungsi Weibull, fungsi Beta, persentil, uji Kolmogorov-Smirnov

COMPARATION STUDY ON IMPLEMENTATION OF WEIBULL AND BETA FUNCTION FOR DIAMETER AT BREAST HEIGHT DISTRIBUTION OF TEAK STAND IN THE AREA OF PERUM PERHUTANI UNIT I JAWA TENGAH

ABSTRACT

Sustainable forest is achieved by proper yield regulation. The implementation of right yield regulation need the availability of basic information concerning stand dynamic. One of this information that able to describe stand dynamic is stand structure dynamic based on diameter distribution. Some research regarding of this information have been conducted on teak stand in Java and concluded that Beta and Weibull function are appropriate for diameter distribution modeling.

This research is conducted to observed more comprehensive about diameter distribution modeling based on these functions. Both of them implemented at 49 plots at compartments with Age-class I - VII on 6 KPHs (Kesatuan Pemangkuan Hutan) in Central Java. Tree Dbh in each plot was measured and mapped mathematically. Weibull and Beta function used as basic model for diameter distribution of each plot. The goodness and fit of models tested by Kolmogorov-Smirnov-rule.

The result showed that Beta function is more accurate than Weibull. Kolmogorov-Smirnov test for 5% and 1% significant level showed that there are 4 significant plots (inappropriate models). Meanwhile Weibull function with percentile 17th and 97th result 9 inappropriate models for 5% significant level and 5 inappropriate models for 1%. In the other hand, Weibull function with percentile 40th and 82nd result 8 inappropriate models for 5% significant level and 7 inappropriate models for 1%. Based on Beta-diameter-distribution-models then diameter-distribution-expectation models for every aged-class and site-index was arranged. These models are: $\phi max = 8.589 + (1.061*\phi rata)$, $\phi min = -4.667 + (0.863*\phi rata)$, $Var\text{-}D = -21.649 + (1.717*\phi max) + (2.296*\phi min) + (0.716*\phi rata) + (0.0003306*N)$, with ϕmax = maximum diameter, ϕmin = minimum diameter, $\phi rata$ = average diameter, and $Var\text{-}D$ = diameter varians.

Key words: stand dynamic, diameter distribution, Weibull function, Beta function, percentile, Kolmogorov-Smirnov-test