

Height-diameter models for prediction of *Tectona grandis* L.f. stands in the Oluwa forest reserve, Nigeria

ABSTRACT

The Diameter-height relationship is a key input component in forest growth and yield models as well as description of stand dynamics. This study was conducted to fit and evaluate ten existing nonlinear height diameter functions for *Tectona grandis* in Oluwa forest reserve (Nigeria). Three hundred and ninety-seven (397) trees were measured for their diameter at breast height (Dbh) and height (Ht). Considering heteroscedasticity of the variance, all functions were fitted using weighted nonlinear least square regression. The performance of each model was evaluated using three fit statistics such as root mean squared error (RMSE), Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). Logistic 3-parameters H-D function gave the best fit based on the model's goodness of fit and predictive ability with values of RMSE, AIC and BIC as 2.8925, 1974 and 1990, respectively. Gompertz, Weibull, Chapman-Richards and Michaelis-Menten models also provided good fit results comparable to the observed height-diameter relationship. Logistic model with three parameters has been confirmed to provide a reliable estimate of total tree height for *Tectona grandis* in Oluwa Forest Reserve.

Keywords: Logistic-Evaluation statistics-Performance-Variable.