Empirical models for estimating the stands biomass of teak plantations in Java, Indonesia


Abstract

The development of empirical biomass models has gained a great deal of attention during recent decades. These models have been constructed to facilitate the quantification of forest biomass and carbon sequestration benefits, but few empirical models exist for estimating the stand biomass of teak (*Tectona grandis* L.f.) plantations. This study therefore sought to develop stand-level biomass models that use minimum input data for teak plantations in Central Java, Indonesia. Stand biomass and other stand variables were derived from forest inventory data in Balo (Kebonharjo, Central Java). We used linear and nonlinear regression to develop four types of biomass models: volume to biomass, basal area to biomass, age to biomass, and age and basal area to biomass. These models were then validated using an independent data set. Results indicated that teak stand biomass was accurately estimated using the volume-to-biomass model. In addition, while the accuracy of the age and basal area-to-biomass model was comparable to that of the volume-to-biomass model, the basal area-to-biomass and age-to-biomass models were less accurate. Depending on the availability of input data, at least one of these models will be appropriate for estimating teak stand biomass. Thus, these models should prove quite valuable in supporting the multipurpose management of teak plantations in Java.

Keywords: teak plantations, biomass, carbon, stand-level model, multipurpose management