Aboveground biomass and carbon stock estimation in logged-over lowland tropical forest in Malaysia

ABSTRACT

Forest plays a vital role in controlling the capacity of atmosphere CO2. Known as a ócarbon sinkerô, they manage to capture carbon and store them as biomass. Tropical forest ecosystem is believed to comprise a large number of carbon (C) compared to other natural ecosystem where the majority of C stored in the aboveground vegetation. Estimating carbon is a comprehensive approach to mitigate climate change. However, accurate information on aboveground carbon storage is still not enough. Lacking of standard conversion equation of the aboveground biomass (AGB) to carbon estimation in Malaysia contributes to the problem. Difficulties in the methodology plus the high density of plant species has made it tough to be executed. The study has taken place in a tropical lowland forest which is Bubu Forest Reserve (FR). Summarized inventory data were used with a modified equation to estimate total AGB and carbon stock. All selected tree were harvested and samples from different component (main stem, branches, twigs, leaves) were taken for further analysis. As a result, two allometric equation were formulated for two different groups based on the wood density from the sampled tree which is high wood density class (AGB= 0.05633 x DBH2.75756) and medium wood density class (AGB= 0.00023 x DBH3.75745). Carbon density of most trees sampled in this area was between 45% and 47%. The total aboveground biomass and carbon stock for Bubu FR are 501.74 t ha-1 and 225.55 t C ha-1. In this study, allometric equation with wood specific gravity as a predictor variable can yielded more accurate predictions, even when based on lower sample size than the equation that didnôt include wood specific gravity.

Keyword: Lowland tropical rainforest; Bubu Forest Reserve; Aboveground biomass; Carbon stock; Allometic equation