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Derive Country-Specific Carbon Fraction and Basic Density to Estimate Above Ground Carbon Gain and Compare with IPCC Default Values for *Tectonia grandis*

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Abstract

The Intergovernmental Panel on Climate Change (IPCC) estimates the greenhouse gas emissions (GHGs) in different sectors; Industrial sectors, Energy sector, Waste sector and land use, forestry and agriculture sector. In estimating GHGs, though certain default values by the region are being used, those factors vary depending on the local topography, climate and the type of species. The objective of this study was to derive the country-specific Carbon Fraction (CF) and Basic Density (BD) value of *Tectonia grandis*. The secondary objective of this study was to compare the estimation of above-ground carbon gain of *T. grandis* values with carbon gain calculated using derived CF and BD with carbon gain calculated using IPCC default values of *T. grandis*. Four study sites were selected from Kurunegala district (Athagala, Iriminna) to represent intermediate zone and Anuradhapura district (Ashokpura, Palagala) to represent the dry zone Teak plantations. Due to variations in the selected plantations, two 0.05 ha squared plots were laid out from each selected plantation by using simple random sampling method. Stem core samples at breast height were extracted and eight twigs and eight leaves were collected from each individual in the plot. The carbon content of collected core stem samples, twigs and leaves were measured using loss on ignition method. The estimated carbon fraction is significantly different from the default carbon fraction and the estimated basic density is also significantly different from the default basic density for *T. grandis*. Results of the comparison of carbon gain estimation by using estimated carbon fraction and basic density with default carbon fraction and basic density indicated that there is a significant difference between the two methods.

Keywords: *Tectonia grandis*, IPCC, Default values, Carbon fraction, Basic density