Above Ground Biomass Estimation of *Gliricidia sepium*

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Gliricidia sepium is the most widely known cultivated species which belongs to genus *Gliricidia* is a tree species with several remarkable attributes. As a result it is popular among the farming communities of the Asian and Pacific region. Even though, weighing of the actual tree biomass in the field is the most accurate method to determine tree biomass, it is an extremely time consuming and destructive method. Use of allometric relationships yields a non-destructives and indirect measurement of biomass components and is often the preferred approach since it is less time consuming and less expensive than direct measurements. Development of relationship between biomass and diameter is very useful for the timber merchants and to the officers who are involved in the legal procedures of felling. This study was carried out to identify the relationship among tree biomass and diameter at the breast height, basal diameters and tree height. For this purpose different fitted models were tested to select a most appropriate model. To develop the relationship between biomass/carbon stock and the tree parameters (Tree height, Diameter, Weight) 22 trees were felled and measured. Standing trees 732, were measured for their diameter and height and predicted the weight and carbon stock based on felled trees. A number of non-linear models were used to identify the best fitted model for biomass estimation using SPSS software. Coefficient of determination (R^2) and RMSE was used to identify the appropriate model. Polynomial quadratic model was found as the best model for estimating the above ground fresh biomass and carbon stock of *Gliricidia sepium.* No relationship between biomass with tree height was observed due to maturity of the trees. Most appropriate fitted model for total biomass was: Total weight :w = -5.949 *D20+1.142* $D20^2$. Most appropriate fitted model for total carbon stock was ,Total carbon stock :C=- 2.974 *D20 + 0.571 * $D20^2$ (D20;Diameter at the 20cm above root collar)

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