Allometric Models for Predicting Above-Ground Biomass and Carbon Stock of Fodder Tree Species in Northwestern Himalayas

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Abstract: Five important fodder species of mid-hill zone of North-Western (NW) Himalayas *viz. Grewia optiva, Celtis australis, Bauhinia variegata, Leucaena leucocephala,* and *Morus serrata* were selected for the study. Whole tree biomass, biomass partioning, the carbon content of each part, was determined. Five models *viz,* linear, quadratic, cubic, power and compound were tried and tested with the data of biomass and carbon of fodder trees. Test statistics *viz*. T-test, R^2, adjusted R^2 and Standard Error (SE) were applied to arrive at the best fit model for each parameter. It was found that for leaf estimation of *B. variegata* and *G. optiva* compound model, for *L. leucocephala* and *M. serrata* power model and for *C. australis* Quadratic model is the best fit. Similarly, for other parameters like branch biomass, above-ground biomass, rate of carbon sequestration, and above ground carbon stock best fit models have been derived. The models developed had high significance as tested with different statistics and thus can be applied for NW Indian Himalayas.

Keywords: Allometric equations, Carbon sequestration, Carbon stock, Fodder tree