

Referência Completa do Artigo:

Magalhães, Tarquinio Mateus and Rosta Simão Mate. 2018. "Least Squares-Based Biomass Conversion and Expansion Factors Best Estimate Biomass than Ratio-Based Ones: Statistical Evidences Based on Tropical Timber Species." MethodsX 5:30-38.

Resumo Original (Abstract):

Due to its readiness to convert stem volumes (V) into biomass, national and regional aboveground biomass estimates and greenhouse gas reporting are generally based on biomass conversion and expansion factors (BCEFs). BCEF-based biomass (W) is computed by the following regression through the origin (RTO): $W = BCEF \times V$. However, the regression slope (BCEF) is not obtained using least squares (LS); it is obtained as the ratio of observed biomass and stem volume. Therefore, the sum of squares of the residuals is not minimum. This may lead to strongly biased biomass estimates. Furthermore, in this case, the biomass is not modelled. In the present study, it was suggested that BCEFs should be obtained using LS through RTO. The objective of this study was to compare LS-based and ratio-based BCEFs with regard to predictive accuracy and ability. A dataset of 75 trees from 4 species was used for the comparisons. LS-based BCEFs were associated with higher predictive accuracy and ability than ratio-based ones. It was proved that RTO is appropriated for estimating BCEFs, as the intercept a was consistently not significant. Ratio-based BCEFs may lead to seriously biased biomass and carbon stocks estimates. BCEFs should be estimated using least squares.

Palavras Chave (Keywords):

Biomass, Biomass conversion and expansion factors, Miombo, Mopane

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Revista e Journal:

Elsevier, MethodsX

Link de Acesso ao Artigo:

<https://doi.org/10.1016/j.mex.2018.01.005>