

Variation of Mangrove Above-ground Dry Biomasses in Relation to Anthropogenic Disturbances

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Abstract

Estimations of Above-Ground Biomasses (AGB) assist determining the mangrove carbon stocks in the views of mitigating the increased atmospheric carbon. Such studies are rare in Sri Lankan mangrove systems, particularly for Rekawa mangroves which is one of the prime mangrove sites in the country. The current study applied a non-destructive, common aboveground allometric equation in to four 30m long mangrove transects (divided in to three 10m × 10m blocks) of north mangrove community (06°03'N 80°50'E) of Rekawa Lagoon, Sri Lanka. For the equation, the diameter at the breast height of all the living mangrove trees and the diameter at the highest point of the cut stumps were recorded. Wood density values required for the equation were referred from literatures while for the mostly harvested (95%) *Lumnitzera racemosa* and *Aegiceras corniculatum*, the values (0.738±0.034 and 0.547±0.032 gcm⁻³ respectively) were evaluated gravimetrically. The living AGB values (mean±SD) of the transects (137.1±69.8, 201.8±102.6, 62.4±38.0 and 68.7±23.6 tha⁻¹) were significantly different between the transects (Friedman test: S = 8.20, DF = 3, p<0.05). The removed AGB (mean±SD) due to tree cuttings were 29.3±22.8, 6.4±8.7, 25.0±12.6 and 30.8±13.3 tha⁻¹ for the four transects and were not significantly different (Friedman test: S = 2.50, DF = 3, p>0.05). However, the % removal of biomass in the transects (19.7, 3.7, 34.3 and 31.79) were significantly different (Friedman test: S = 7.40, DF = 3, p<0.05) where these values were 14.6, 2.9, 41.6, 0.0, 9.0, 2.3, 18.4, 16.4, 67.9, 34.2, 16.6 and 44.6 for the studied 12 plots. Thus, except in one plot, all other plots had experienced anthropogenic biomass removal where one plot had as high as 67.9% removal. The total Basal area (mean±SD) of the living trees four transects (37.0±16.1, 43.1±11.1, 22.1±13.5 and 19.4±7.4 m² ha⁻¹) show significant difference (Friedman test: S = 8.20, DF = 3, P = 0.04). However, referring to, only two studied blocks had relatively undisturbed forests with basal area >45 m² ha⁻¹ while degraded forest conditions were observed in another two plots having basal area <15 m² ha⁻¹. Thus, the current study revealed notable anthropogenic AGB removal in Rekawa area where necessary management actions need to be implemented to secure the mangrove carbon stocks.

Keywords: Above ground biomass, Tree cuttings, Rekawa, Sri Lanka