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Effects of air pollution on carbon sequestration potential in two tropical forests of West Bengal, India

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摘要	Tropical forests store more carbon in their above ground biomass than other forest habitats. Species and site specific allometric equations are desired to evaluate precise and dependable results of tree biomass. This study, therefore, aims to assess and compare the carbon sequestration potential (CSP) between two forests (Barjora forest, Bankura and Ballavpur Wildlife Sanctuary (BWLS), Bolpur, West Bengal), having different air pollution levels, by using a non-destructive sampling method. In the present study, it was observed that the CSP varied with different species and diameter class. Shorea robusta Gaertn. has a maximum CSP with 30284.8 kg ha(-1) and 261004.3 kg ha(-1) at Barjora forest and BWLS respectively among all the other measured tree species. The results indicated that all the tree species, with diameter at breast height (DBH) > 30 cm, contributed about 40.89% and 69.97% CSP at Barjora and BWLS, respectively. Independent samples t-test and Mann-Whitney U test were undertaken to check the significant difference between the CSP of different species, different diameter classes and different pollutant loads of the two forests. A statistically significant difference was found in carbon sequestration values and the levels of O-3, PM2.5, PM10 between BWLS and Barjora forest (p = < 0.05). Multiple linear regression model revealed that CSP decreased with increasing levels of air pollutants (NO2, O-3, PM10 and PM2.5). The results indicated that air pollution played an important role in the reduction of CSP of tropical forest located at polluted site. It was found that among the 8 common tree species, Shorea robusta Gaertn., with maximum CSP, followed by Acacia auriculiforrnis Benth., Eucalyptus globulus Labill., and Madhuca indica J.F. Gmel. may be recommended for afforestation programmes in the polluted site to reduce air pollution levels. The study could also be used for implementing Shorea robusta Gaertn. as an indicator species in tropical forest ecosystems in future.
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