

Carbon Stock Estimation of Urban Forests in Selected Public Parks in Addis Ababa

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Abstract : Urban forests can help to improve the microclimate and air quality. Urban forests in Addis Ababa are important sinks for GHGs as the number of vehicles and the traffic constrain is steadily increasing. The objective of this study was to characterize the vegetation types in selected public parks and to estimate the carbon stock potential of urban forests by assessing carbon in the above, below ground biomass, in the litter and soil. Species which vegetation samples were taken using a systematic transect sampling within value $DBH \geq 5\text{cm}$ were recorded to measure the above, the below ground biomass and the amount of C stored. Allometric models ($Y = 34.4703 - 8.0671(DBH) + 0.6589(DBH^2)$) were used to calculate the above ground and Below ground biomass ($BGB = AGB \times 0.2$) and sampling of soil and litter was based on quadrates. There were 5038 trees recorded from the selected study sites with $DBH \geq 5\text{cm}$. Most of the Parks had large number of indigenous species, but the numbers of exotic trees are much larger than the indigenous trees. The mean above ground and below ground biomass is 305.7 ± 168.3 and 61.1 ± 33.7 respectively and the mean carbon in the above ground and below ground biomass is 143.3 ± 74.2 and 28.1 ± 14.4 respectively. The mean CO_2 in the above ground and below ground biomass is 525.9 ± 272.2 and 103.1 ± 52.9 respectively. The mean carbon in dead litter and soil carbon were 10.5 ± 2.4 and 69.2t ha^{-1} respectively. Urban trees reduce atmospheric carbon dioxide (CO_2) through sequestration which is important for climate change mitigation, they are also important for recreational, medicinal value and aesthetic and biodiversity conservation.

Keywords : biodiversity, carbon sequestration, climate change, urban forests

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