

Exploring urban tree diversity and carbon stocks in Zaria Metropolis, North Western Nigeria

ABSTRACT

Urbanization is a pressing issue of concern especially in Africa where it is expected to continue and increasingly, threaten the efficiency of natural carbon sinks and sustainability of cities. This paper assessed the diversity and carbon storage of trees in Zaria metropolis, North-western Nigeria through fieldwork and allometric equations. A total of 200 assessment plots were randomly generated using Idrisi Terrset software. Quadrats of 30 × 30 m dimension were established and all trees, ≥ 5 cm diameter were identified and enumerated. Diameter was measured at breast height while tree height was measured with Suunto clinometer. The study recorded 836 stems, belonging to 51 species in 21 families. Species diversity and evenness were considerably high ($H' = 3.30$, $J = 0.8$) with more exotic than native stems. The trees stored 657.05t carbon with the highest proportion contributed by *Azadirachta indica*, *Mangifera indica* and *Khaya senegalensis*. One-way ANOVA revealed significant difference in tree diameter ($p < 0.020$), basal area ($p < 0.008$) and height ($p < 0.001$) across the different land use/cover types but no significant difference in carbon stock ($p > 0.657$). This study demonstrates the contribution of urban trees in reducing global atmospheric carbon which largely varies with tree species and diameter.

Keyword: Aboveground biomass; Carbon stock; Diversity; Native species; Exotic species