

CARBON STOCKS OF NEEM TREE (*Azadirachta indica* A. Juss.) IN DIFFERENT URBAN LAND USE AND LAND COVER TYPES IN NIAMEY CITY, NIGER, WEST AFRICA

Soulé Moussa*¹, Boateng Kyereh², Abasse Amadou Tougiani³, Mahamane Saadou⁴

1. West African Science Centre on Climate Change and Adapted Land Use (WASCAL), Department of Civil Engineering, College of Engineering, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana. Email: smoussa@st.knust.edu.gh
Telephone: +22796801125 +233501589424
2. Department of Silviculture and Forest Management, Faculty of Renewable Natural Resources, Kwame Nkrumah University of Science & Technology, Kumasi, Ghana.
3. Département de Gestion des Ressources Naturelles, Institut National de la Recherche Agronomique (INRAN) du Niger, Niamey.
4. Département de Biologie, Faculté des Sciences et Techniques, Université Dan Dicko Dankoulodo Maradi, BP: 465 Maradi, Niger.

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ABSTRACT

Urban trees play a crucial role in carbon offset. Nevertheless, much attention has been focused on natural trees role in atmospheric carbon reduction. Specifically, in Niger, the estimation of carbon stock of urban trees remains unexplored areas for climate change mitigation. The objective of the paper was to estimate carbon stock of *Azadirachta indica* in Niamey. We assessed the structure and carbon stocks of neem trees across urban land use and land cover types using non-destructive method. We measured 853 (DBH $\geq$ 5 cm) stems within 102 plots over 19.41 ha. The mean and standard error of neem structural characteristics were density 48 ± 9.06 stem/ha, basal area was 5.23 ± 0.93 m²/ha, tree cover was $26.84 \pm 4.48\%$. Neem trees structural characteristics varied significantly across land use and land cover types ($P = 0.001$). Big stems ($40 > \text{cm}$) contributed about 72% to the total aboveground biomass. The mean carbon density was 24.17 ± 3.50 t/ha. While the highest carbon stock was observed in commercial areas (67.05 ± 27.49 t/ha), the second lowest carbon stock was in administrative areas (14.04 ± 2.71 t/ha). Neem trees should be accounted for in urban land use planning and national biomass carbon inventory. These results complement the international tree carbon dataset and reference level from Sahel city for climate change mitigation.