

Assessing the Impact of Human-Induced Disturbances on the potential Biomass and Carbon content in two wildlife sanctuaries of Uttar Pradesh, India

Azram Tahoor^{1*}, Azra Musavi² and Jamal Ahmad Khan³

^{1*}*Department of Environmental Science, Integral University, Lucknow 226 001, U.P., India*

²*Advanced Centre of Women's Studies, Aligarh Muslim University, Aligarh 202 002, U.P., India*

³*Department of Wildlife Sciences, Aligarh Muslim University, Aligarh 202 002, U.P., India*

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ABSTRACT

This research paper presents a detailed analysis of biomass assessment of woody species in Katerniaghat and Kaimoor Wildlife Sanctuary situated in Bahraich and Mirzapur district of Uttar Pradesh. Through a reconnaissance survey, area was stratified into high, medium and low disturbed site based on the presence of human induced disturbance indicators. Circular plot method of 10m radius was used for vegetation assessment. Data on vegetation like woody species name, number of individuals, Girth at Breast's height were recorded. Biomass and carbon stock of tree species was calculated from each stratified site of both sanctuaries. The finding of the study showed that highest biomass was estimated from high disturbed site of Katerniaghat. In Kaimoor, medium disturbed site showed maximum biomass. The present study aims to provide a comprehensive understanding of its carbon stock and sequestration potential. Biomass assessment is crucial for sustainable forest management and climate change mitigation strategies. Our findings reveal the negative impact of varying levels of anthropogenic disturbance on the forest biomass of both protected areas and help in better understanding of conservation and management and forests and carbon offset initiatives.

Key words : *Tree species biomass assessment, Carbon stock, Anthropogenic disturbance, Sustainable forest management,*

Introduction

A forest ecosystem is an area comprised of complex heterogeneous vegetation. The vertical stratification of forests exhibits distinct layers or strata, each inhabited by different species adapted to specific environmental conditions and resource availability. The uppermost layer of a forest is composed of mature trees that form a dense leafy cover, shading the forest floor below. The layer beneath the canopy consists of smaller trees, shrubs, saplings, and herbaceous plants that receive filtered sunlight. The lowest layer is characterized by organic matter, leaf

litter, soil, and diverse microorganisms, fungi, and invertebrates. Forest ecosystems vary greatly in their composition, structure, and function depending on factors such as climate, soil type, topography, and disturbance history. In India, forests were classified by Champions and Seth in 1968 based on rainfall and temperature data (Senthilkumar *et al.*, 2014). Tropical forests play a vital role in supporting biodiversity, regulating climate, providing ecosystem services, sustaining human livelihoods, sequestering atmospheric carbon dioxide (CO₂) through photosynthesis and storing it in biomass; therefore, a major contributor to net primary production

Corresponding author's email: azram@iul.ac.in, musaviazra21@gmail.com, secretarywsi@gmail.com