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Rajiv Ranjan Srivastava · Javid Dar ·
Subashree Kothandaraman *Editors*

# Advances in Environmental Sustainability, Energy and Earth Science

## Proceedings of the 1st International Conference AESEE-2024

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# Uncovering the Impact of Forest Resource Extraction on Mammalian Communities in Selected Wildlife Sanctuaries of Uttar Pradesh, India


**Azram Tahoor, Azra Musavi, and Jamal Ahmad Khan**

**Abstract** The removal of forest resources, driven by increased human demand for timber, fuelwood, and other natural commodities, has significant repercussions on forest ecosystems and their inhabitants. Katarniaghat (400 sq.km.) and Kaimoor (500 sq.km.) Wildlife Sanctuaries situated in Utttar Pradesh were selected to carry out the study. Depending on the reconnaissance survey regarding the anthropogenic disturbance variables such as human trails, grazing cover, weed cover, lopping density, and fire, the protected area was categorized into high, medium, and low disturbed sites. For data collections, line transect method (direct sighting) and pellet group method (indirect evidence) were used to record mammals. Circular plot of 10 m radius was used to evaluate and quantify habitat variables. The data were analyzed using Kruskal-Wallis test using SPSS comparing density, abundance, area preference, mean group size, and encounter rate of the species. The low disturbed areas of Katarniaghat and Kaimoor showed higher values for overall mean pellet group density (13.26 ± 2.01 and 17.84 ± 1.6), abundance (0.007 ± 0.001 and 0.008 ± 0.001), area preference (0.52 ± 0.07 and 0.25 ± 0.01), encounter rate (2.9 ± 0.43 and 1.26 ± 0.22), and mean group size (2.9 ± 0.43 and 2.6 ± 0.5) of mammals, respectively. However, some species showed affinity toward human disturbance, for example, Nilgai, Jackal, and Langur, which showed their coexistence with human interference. The present study aims to contribute to a better understanding of the complex interactions between forest resource extraction and mammalian communities, offering insights to inform sustainable management practices, conservation efforts, and policy formulation in forested landscapes.

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**Keywords** Mammalian community · Katarniaghat · Kaimoor · Line transect · Pellet group method

## 1 Introduction

In recent years, wildlife conservation has become a significant concern, largely due to the settlement of residents and their reliance on forest resources for sustenance and livelihoods. The dependence on forest resources, including illegal grazing of livestock, collection of fuelwood, logging, and non-timber forest extraction, brings detrimental effects such as habitat loss, which in turn impacts wildlife populations. As human populations grow and expand, the pressure on these ecosystems intensifies, leading to habitat loss, fragmentation, and degradation, all of which threaten the survival of numerous species. Additionally, the socio-economic dynamics of residents play a significant role in shaping their relationship with wildlife and natural resources. Poverty, lack of alternative livelihood options, inadequate access to education and healthcare, and limited awareness about conservation issues can further contribute to unsustainable resource use practices and human-wildlife conflicts. Consequently, the quality of the forest habitat has a notably positive influence on the species richness of wildlife [1]. The positive association between forest habitat quality and wildlife species richness underscores the importance of conserving and restoring natural habitats to sustain biodiversity and ecosystem functioning. The investigation of numerous studies explored the detrimental effects of forest resource extraction on mammals [2–9].

Human activities determine the magnitude and reasons behind the dispersal of wild species [2], owing to ecological distribution in habitat utilization between wildlife and domestic [1]. The wildlife population is influenced by the intensity of human use, which can limit food supplies [6, 10]. However, ecological factors such as vegetation also play role in shaping wildlife populations affected by human activities [11, 12]. Few studies have shown a positive correlation between wildlife and human-induced disturbance, demonstrating that primates and elephants can tolerate logging and survive in logged forests [13, 14], and ungulates prefer open habitats resulting from logging and grazing [15].

The study aims to understand how the level of reliance on forest resources by local communities affects mammal populations within protected areas. The study compared the density, abundance, area preference, encounter rate, and mean group size of mammals across three sites categorized by the magnitude of human disturbance. The present study can have needful measures for conservation policies and strategies, helping to inform efforts to balance the needs of both human communities and wildlife within protected areas. Therefore, by examining the relationship between forest resource dependence and wildlife, this study aims to enhance understanding of how the magnitude of human activities influences mammal density, thereby contributing to conservation biology.