

# Understanding Nilgai Activity Patterns in Rajasthan: A Study on Habitat Use and Behavioral Ecology

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## ABSTRACT:

This study investigates the seasonal activity patterns of the Nilgai (*Boselaphus tragocamelus*) in the Marwar region of Rajasthan, characterized by its arid to semi-arid climate. Conducted across diverse habitats—grasslands, forest edges, and agricultural areas—the research analyzed Nilgai behavior during winter, summer, and monsoon seasons. Data on feeding, running, standing, and resting activities reveal significant seasonal variations.

**Keywords:** Nilgai, Rajasthan, habitat use, behavioral ecology, seasonal variations, wildlife management

## INTRODUCTION

The Nilgai (*Boselaphus tragocamelus*), the largest antelope in Asia, is a crucial species in India's arid and semi-arid ecosystems. In Rajasthan, a state characterized by its extreme climate and diverse landscapes, the Nilgai plays a vital role in shaping vegetation patterns and maintaining ecological balance. Its adaptability to harsh conditions makes it an interesting subject for studying seasonal behavior.

Rajasthan's climate fluctuates significantly across seasons, affecting water availability and vegetation growth. These environmental changes influence Nilgai activity patterns, including feeding, movement, and resting. Understanding these patterns is essential for wildlife management, particularly in areas where human-wildlife conflicts are common due to agricultural expansion and habitat encroachment.

This study aims to investigate the seasonal variations in Nilgai activity in Rajasthan, focusing on their behavior during winter, summer, and monsoon. By analyzing how Nilgai adjust their activity levels in response to changing environmental conditions, the research seeks to provide insights into their ecological role and inform conservation strategies. Accurate data on Nilgai behavior will aid in managing human-wildlife interactions and supporting the long-term conservation of this significant species.

## Material and Methods

**Study Area:** The study was conducted in the Marwar region of Rajasthan, located in northwestern India. This region is characterized by its arid to semi-arid climate, with extreme temperature variations and low annual rainfall, ranging from 200 to 400 mm. Marwar experiences hot, dry summers with temperatures often exceeding 40°C and cooler winters, with significant seasonal shifts affecting the environment. The landscape of Marwar includes diverse habitats such as expansive grasslands, forest edges, and

agricultural lands. Grasslands provide vital grazing resources for the Nilgai (*Boselaphus tragocamelus*), while forest edges offer necessary cover and protection. Agricultural areas, increasingly encroaching on natural habitats, present both opportunities for additional food and challenges due to potential human-wildlife conflicts

**Data Collection**

Data were collected through direct observations and GPS tracking over a 16-month period from February 2020 to May 2021. Activity data were categorized by feeding, running, standing, resting, and other behaviors, recorded across three seasons: winter, summer, and monsoon.

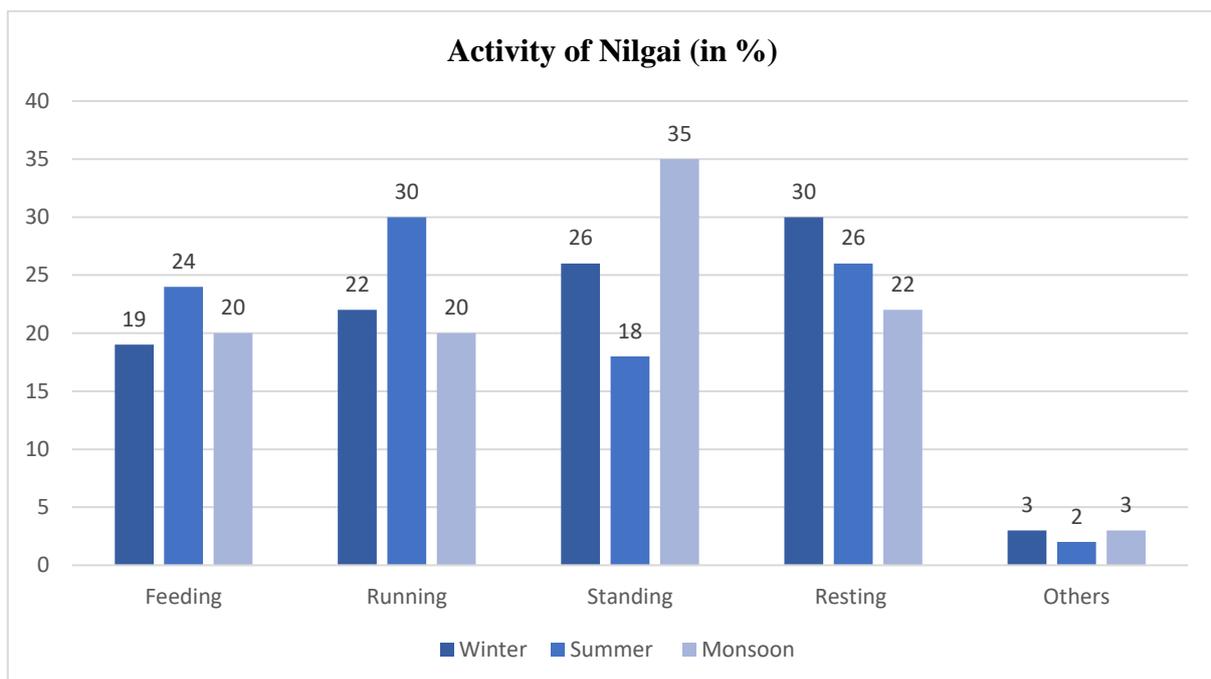
**Results and Discussions**

**Activity Patterns**

Seasonal variations in Nilgai activity were noted. During winter, Nilgai spent 19% of their time feeding, 22% running, 26% standing, and 30% resting. In summer, these figures shifted to 24% feeding, 30% running, 18% standing, and 26% resting. In the monsoon season, Nilgai’s activity was 20% feeding, 20% running, 35% standing, and 22% resting. The "other" activities were minimal across seasons (3% in winter and monsoon, 2% in summer).

**Table1. Activity patterns of Nilgai (*Boselaphus tragocamelus*) during study period.**

| Activity (in %) | Winter | Summer | Monsoon |
|-----------------|--------|--------|---------|
| Feeding         | 19     | 24     | 20      |
| Running         | 22     | 30     | 20      |
| Standing        | 26     | 18     | 35      |
| Resting         | 30     | 26     | 22      |
| Others          | 3      | 2      | 3       |



**Graph1. Activity in percentage (%) of Nilgai (*Boselaphus tragocamelus*)**



(A) (B)  
**Fig. 1 (A) Nilgai females and Fawns, (B) Nilgai Male.**

### Habitat Preference

Nilgai demonstrated a clear seasonal shift in habitat preference. During the dry season, they favored areas with accessible water and dense vegetation, while in the wet season, their range extended to include more natural grasslands.

Nilgai's behavior included foraging, social interactions, and territorial displays. During the summer, increased running and feeding suggest a response to high temperatures and resource scarcity. The monsoon season saw increased standing behavior, likely due to cooler temperatures and abundant vegetation.

### DISCUSSION:

The study reveals that Nilgai exhibit adaptive behavior in response to seasonal changes. Their increased running and feeding in summer reflect the need to cope with heat and reduced food availability. In contrast, the monsoon brings cooler temperatures and abundant resources, leading to more time spent standing. These findings emphasize the need for targeted conservation measures that account for seasonal behavior changes and habitat preferences.

### CONCLUSION:

Understanding Nilgai activity patterns provides valuable insights for wildlife management in Rajasthan. The study highlights significant seasonal variations in behavior, with implications for habitat management and conservation strategies. Addressing the impacts of human activities and climate change is crucial for sustaining Nilgai populations.

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