

GRAZING BEHAVIOUR OF BLACKBUCK (*Antelope cervicapra*) WITH RELEVANCE TO HABITAT CHANGES IN TELANGANA AGRICULTURAL LANDSCAPES

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ABSTRACT

Blackbuck (*Antelope cervicapra*), medium-sized antelope is native to the Indian subcontinent (primarily India and Nepal). It thrives in open grasslands and lightly wooded areas near water sources. Blackbuck has increasingly expanded into agricultural landscapes due to habitat alteration, land-use change, and climatic variability. In recent years, several districts of Telangana have reported increased crop depredation and spatial redistribution of blackbuck populations. The present study examines grazing behaviour of blackbuck across different crop systems, their shifting and spread across landscapes. A total of 37 observations covering 9 villages of two mandals in Nalgonda district showed an average herd size of 14.3 animals. The minimum herd size was 4.6 and the maximum was 14.2. The herd size range was maximum in Damera (2-28) followed by Nemallagudem (2-21). Indiscriminate changes in the habitats resulted in drastic modification in land use conditions and reduced grass land productivity forcing blackbuck to exploit cultivated fields. The proportion of crop damage by blackbuck in different growth stages showed that, in maize the extent of damage was high during sprouting stage (36.2%) followed by vegetative stage (26.6%) while in cotton blackbuck caused damage more during flowering stage (38.5 %). In groundnut the extent of damage was noticed in all stages and ranged between 14.8 % (sprouting stage) to 34.5% (maturity stage). The study highlights the need for integrated, adaptive management frameworks to conserve blackbuck populations while enhancing resilience of agro-ecosystems under changing climatic conditions.

KEYWORDS: Blackbuck, grazing, climate change, Agricultural landscape, Telangana

The blackbuck (*Antelope cervicapra*) is one of the most prominent antelope species inhabiting the open grasslands and semi-arid ecosystems of the Indian subcontinent (Schaller, 1967; Prater, 1971). Historically, blackbuck populations were widely distributed across natural grasslands, scrublands, and savannah ecosystems (Rahmani, 1990). However, extensive agricultural expansion, urbanization, and habitat fragmentation have drastically reduced natural grassland habitats in India (Jhala and Isvaran, 2016). As a consequence, blackbuck populations have increasingly adapted to agricultural landscapes, particularly in states such as Telangana where large tracts of dryland agriculture coexist with remnant grasslands (Isvaran, 2005; Jhala and Isvaran, 2016). Climate change has further intensified these ecological transformations by altering rainfall patterns, increasing temperature variability, and affecting vegetation productivity (IPCC, 2021). These climatic changes influence forage availability and quality, which in turn affect the feeding ecology and grazing behaviour of herbivores (Ogutu *et al.*, 2014). Blackbuck are primarily grazers that prefer short grasses and herbaceous vegetation, but they exhibit dietary flexibility when natural forage becomes scarce (Schaller, 1967; Isvaran, 2005). In Telangana,

blackbuck frequently utilize agricultural fields as alternative feeding grounds, especially during periods of drought or seasonal grass scarcity (Rahmani, 1990; Jhala and Isvaran, 2016). This shift in grazing patterns has led to increased human–wildlife interactions and crop depredation incidents. Understanding the relationship between climate variability and grazing behaviour of blackbuck in agricultural landscapes is therefore essential for developing sustainable conservation strategies and mitigating conflicts with farmers. The present study aims to examine the influence of habitat changes on grazing behaviour, habitat use, and dietary preferences of blackbuck in selected agricultural landscapes of Telangana (Plate 1 & Plate 2).



Plate 1. Blackbuck Herd (Direct sighting)

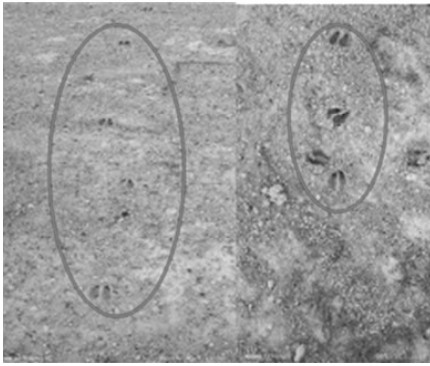


Plate 2: Blackbuck hoofprints

MATERIAL AND METHODS

The study was conducted by AINP VPM, PJTAU in the year 2023-2024 covering nine villages located in two mandals *viz.*, Marriguda and Nampally of Nalgonda district, Telangana, India, where populations of the Blackbuck are frequently observed in agricultural landscapes (Fig. 1). The region experiences a semi-arid climate, characterized by hot summers, mild winters, and monsoon rainfall primarily between June and September. The landscape is dominated by rainfed agricultural systems, where major crops include groundnut, maize, and cotton, along with scattered patches of fallow lands, scrub vegetation, and remnant grasslands. These heterogeneous land-use patterns

provide both natural forage and cultivated crop resources that are often utilized by blackbuck for feeding. Observations were carried out during daylight hours, particularly in early morning and late evening periods, when feeding activity is generally highest. Herds were observed from a distance of approximately 50 m to minimize disturbance to the animals. Binoculars were used to monitor foraging behaviour and feeding activity. The bite count method was employed to assess diet composition and feeding intensity. Observations were recorded at 30-minute intervals, which allowed sufficient time to inspect feeding sites and identify freshly grazed plant species. After each feeding session and once the animals had moved away from the site, the plant species consumed were identified and recorded. During each observation session, the following parameters were documented: habitat type used for feeding (agricultural fields, fallow lands, and grasslands); crop species or plant species. The quadrat sampling method was used to record plant species composition and relative abundance in grazing areas. Quadrats were randomly placed in crop fields (groundnut, maize, cotton) and adjacent grassland or fallow patches to identify the dominant forage species available to blackbuck.

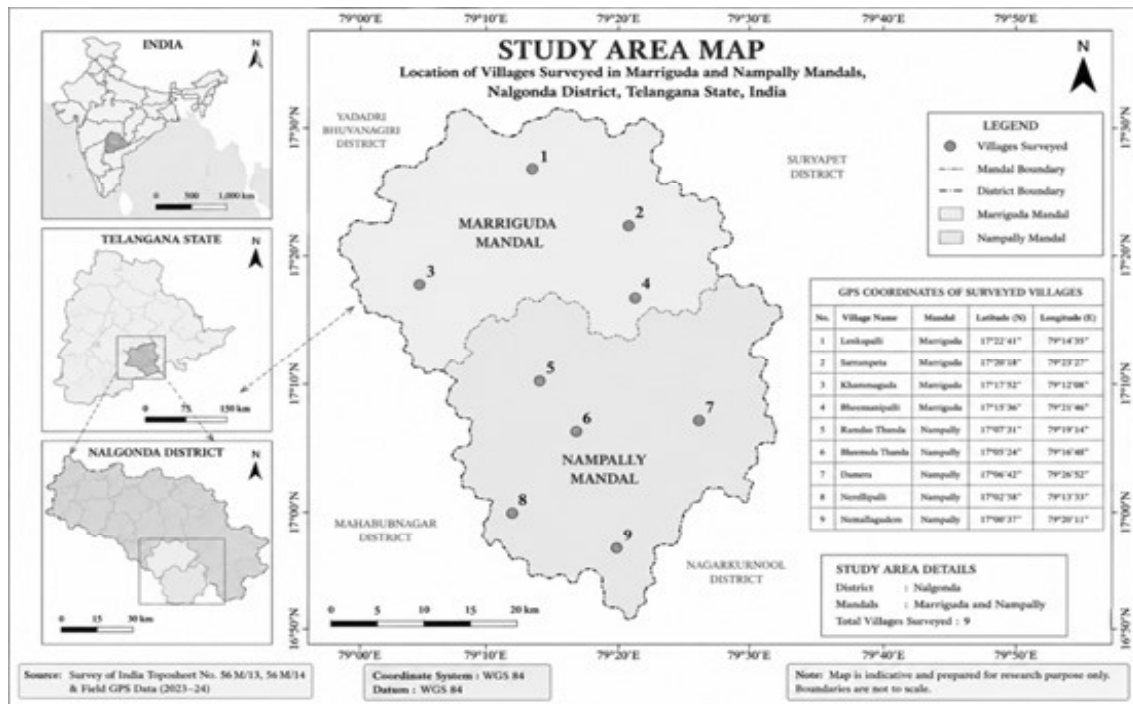


Fig.1: Study area map

RESULTS AND DISCUSSION

Grazing Behaviour and Activity Patterns

Field observations conducted in nine villages across two mandals (Marriguda and Nampally) of Nalgonda district, Telangana during the year 2023-24, revealed that blackbuck spent a considerable portion of their daily activity grazing within agricultural landscapes. Peak feeding activity was observed during the early morning and late evening hours, whereas animals remained relatively inactive during the midday period. This pattern is likely associated with avoidance of high daytime temperatures and heat stress in semi-arid environments. Similar diurnal activity patterns in blackbuck were reported by Schaller (1967) and Isvaran (2005), who observed that blackbuck generally synchronize their feeding behaviour with cooler periods of the day to reduce thermal stress and optimize energy expenditure. Studies by Jhala and Isvaran (2016) also indicated that grazing ungulates inhabiting open grasslands adopt such temporal feeding strategies under semi-arid climatic conditions. Comparable observations in agricultural landscapes of Telangana were reported by Aruna *et al.* (2024) while Deepak and Jyoti, 2018

revealed that blackbuck causes considerable economic losses to crops in the state of Haryana. A total of 37 observations covering 9 villages of two mandals in Nalgonda district showed an average herd size of 8.6 ± 2.2 . The minimum herd size was 4.6 ± 1.3 and the maximum was 14.2 ± 3.6 . The herd size range was maximum in Damera (2-28 individuals/herd) followed by Nemallagudem (2-21 individuals/herd) (Table.1). Among the surveyed villages, Damera recorded the highest herd size range (2-28 individuals/herd) followed by Nemallagudem (2-21 individuals/herd). Larger herd sizes were generally associated with areas containing extensive croplands and open habitats, which provide better visibility and abundant forage resources. Smaller herd sizes observed in villages Ramdas Thanda and Nerellipalli may be due to limited forage availability and increased human disturbance.

Crop Damage Patterns in Agricultural Fields

Field observations revealed that the extent of crop damage varied with crop species and growth stages. Blackbuck showed a strong preference for young and tender plant parts, particularly during early growth stages. The proportion of crop damage by

Table 1. Herd size distribution of blackbuck in different villages of the study area

S.No.	Village name	Number of observations (N)	Mean herd size ($\pm$ SE)	Herd size range
1	Lenkapalli	6	12.4 ± 3.1	3-26
2	Sarrampeta	3	6.4 ± 1.8	2-15
3	Khammaguda	5	10.2 ± 2.7	2-22
4	Bheemunipalli	5	9.0 ± 2.4	2-19
5	Ramdas Thanda	2	4.6 ± 1.3	3-12
6	Bheemula Thanda	2	5.2 ± 1.5	3-15
7	Damera	8	14.2 ± 3.6	2-28
8	Nerellipalli	2	4.6 ± 1.1	2-10
9	Nemallagudem	4	5.1 ± 2.2	2-21
	Overall Mean	37	8.6 ± 2.2	2-28

Table 2. Extent of crop damage by blackbuck at different growth stages in the study area

Crop (n=10)	Total no. of plants damaged/ ha	Overall crop damage (%)	Sprouting stage (%)	Vegetative / Flowering stage (%)	Pod / Cob / Boll Formation stage (%)	Maturity stage (%)
Groundnut	1,05,307	42.6	14.8	21.6	29.1	34.5
Maize	15,626	18.9	36.2	26.6	23.9	13.3
Cotton	4,173	30.4	28.6	38.5	27.4	5.5

blackbuck in different growth stages showed that in maize the extent of damage was high during sprouting stage (36.2%) followed by vegetative stage (26.6%), in case of cotton blackbuck caused damage more during flowering stage (38.5%) whereas in groundnut the extent of damage was noticed in all stages ranged between 14.8 % (sprouting stage) to 34.5% (maturity stage) (Table 2). Similar crop depredation patterns by blackbuck in agricultural ecosystems were reported by Rahmani (1990) and Jhala and Isvaran (2016). Studies conducted in Telangana also indicated that blackbuck frequently utilize groundnut and cotton fields as alternative feeding habitats, particularly during dry seasons (Aruna *et al.*, 2024; 2025). The obtained results were in accordance with Meenakshi *et al.*, 2020, that the Blackbuck generally feed on crops such as chana, wheat, mung, bajra, jowar, guar

CONCLUSION

The present study highlights the significant influence of habitat transformation on the grazing behaviour of blackbuck in Telangana agricultural landscapes. Blackbuck exhibit adaptive feeding behaviour by modifying their diet and habitat use according to seasonal forage availability. The loss of natural grasslands, has encouraged blackbuck to increasingly utilize agricultural fields as alternative feeding grounds. Increasing dependence on crop fields has intensified human–wildlife interactions, emphasizing the need for sustainable management strategies such as habitat restoration, community-based conservation, and eco-friendly crop protection measures to balance wildlife conservation with agricultural livelihoods.

Table 3. Damage severity index of blackbuck on different crops across crop growth stages

Crop	Crop growth stage most preferred by Blackbuck	Peak damage (%)	Damage severity pattern	Vulnerability category	Remarks
Groundnut	Maturity stage	34.5	Increasing trend from early to late stages	Highly vulnerable	Mature pods and succulent plant parts attracted repeated grazing
Maize	Sprouting stage	36.2	Decreasing trend from early to late stages	Moderately vulnerable	Young seedlings highly susceptible to grazing and trampling
Cotton	Vegetative / Flowering stage	38.5	Peak damage during active vegetative growth	Moderately to highly vulnerable	Tender foliage and floral structures preferred

etc., at different locations rather than remaining in a single place, and they do not consume crops while running. Damage to immature crops mainly occurs due to feeding, whereas mature crops are primarily affected by trampling.

Overall, the findings revealed that blackbuck damage varied according to crop type and crop phenology. Groundnut was the most preferred crop, particularly during later growth stages, maize was more vulnerable during early establishment stages, whereas cotton experienced severe damage during vegetative and flowering periods (Table 3). The study highlights the importance of adopting crop stage-specific protection measures to minimize economic losses in blackbuck-prone agricultural landscapes.

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