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Spatial and temporal variations of *Pavo cristatus* (Indian Peafowl) density in Southern Province of Sri Lanka

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The Indian peafowl (*Pavo cristatus*), traditionally native to arid regions of Sri Lanka, has recently been observed migrating to wetter areas, raising concerns about potential crop damage in the Southern Province. This study investigates the spatial variation in Indian peafowl density across the croplands of the Galle, Matara, and Hambantota districts in the Southern Province and the trends related to changes in peafowl abundance and their predators based on community feedback. Density measurements of Indian peafowl were conducted using fixed-width strip-transect (1×0.08 km) surveys in 25 sampling plots from September 2023 to February 2024. The same transects were utilized to determine the density of specific predator species, including jackals, diurnal raptors, and stray dogs. Structured interviews were conducted with 10 households near each transect to gather information regarding noticeable changes in Indian peafowl and predator populations over recent years. A One-way ANOVA, followed by Tukey's test, was used to compare the peafowl densities among the three districts after testing for normality using the Anderson-Darling test in Minitab version 20.2. The association of Indian peafowl density with predator abundance was assessed using Generalized Linear Mixed Models (*glmmTMB* package in R version 4.3.2). Information gathered through structured interviews was used to confirm the presence of predators within the study plots when predators were not reported during transect surveys. The study results indicated the presence of Indian peafowl across all three administrative districts of the Southern Province, which encompass dry, intermediate, and wet climatic zones, and revealed significant differences in peafowl densities per transect among these districts. Hambantota exhibited a significantly higher peafowl density (7.92 ± 2.43) compared to Matara (5.33 ± 1.03) and Galle (3.71 ± 1.11), while no significant difference was observed between Galle and Matara. The analysis revealed that peafowl density was not significantly associated with the densities of stray dogs and raptors or the presence/ absence of jackals ($p > 0.05$; GLMM). According to the survey responses ($n = 500$), 76% of residents from Hambantota district had observed a decrease in peafowl abundance over the past decade, whereas 94% and 98% of respondents from Matara and Galle, respectively, reported an increase in the Indian peafowl density. A majority of respondents (89%) from the Galle and Matara districts reported a noticeable decline in natural predator populations over the past decade, identifying this decline as a major factor contributing to the increased abundance of Indian peafowl in the area. A significant proportion of residents (82%) from the Hambantota district attributed the observed decrease in Indian peafowl density to habitat degradation, particularly the reduction of suitable environments for feeding and reproduction, due to urbanization and construction activities. These findings underscore the need for long-term studies to monitor peafowl densities and address underlying causes to mitigate human-wildlife conflicts.

Keywords: Indian peafowl, Predators, Southern Province