



Climate Change Impact on Reproductive Behaviour of India's National Bird Peafowl (*Pavo Cristatus L.*): A Review

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Abstract

Climate change is increasingly recognized as one of the most important drivers of biodiversity change worldwide. Birds are particularly sensitive to environmental variations because their life cycles, including breeding and feeding behaviour, are closely associated with climatic conditions. The Indian peafowl (*Pavo cristatus*), the national bird of India, is widely distributed across forests, agricultural landscapes, and rural ecosystems throughout the country. Although the species is currently categorized as "Least Concern," recent studies indicate that environmental changes may influence its behaviour, habitat use, and reproductive ecology. Reproductive activities in birds are strongly governed by climatic factors such as rainfall patterns, temperature fluctuations, vegetation growth, and food availability. In India, the breeding season of the Indian peafowl generally coincides with the monsoon period when ecological conditions are favourable for reproduction and chick survival (Yogeshwari & Varunprasath, 2020). However, increasing climatic variability, irregular rainfall patterns, and habitat modification may disrupt these ecological relationships. This review synthesizes recent research (2020–2026) focusing on the reproductive ecology of *Pavo cristatus* in India and discusses how climate change may influence breeding behaviour, nesting success, and population dynamics. The review also highlights important research gaps and emphasizes the need for long-term ecological monitoring and conservation strategies to ensure the sustainability of peafowl populations in changing environmental conditions.

Keywords: Climate change, Indian peafowl, *Pavo cristatus*, reproductive behaviour, breeding ecology, biodiversity conservation, India.



1. Introduction

Climate change has emerged as a major environmental concern affecting biodiversity and ecosystem stability worldwide. Changes in temperature regimes, rainfall patterns, and extreme weather events are increasingly influencing species distribution and ecological interactions (Bhuva K.J 2025). Birds are among the most responsive organisms to climate variability because their breeding cycles and behavioural patterns are strongly influenced by environmental conditions.

The Indian peafowl (*Pavo cristatus*) is one of the most recognizable bird species in India and has significant ecological as well as cultural importance. It was declared the national bird of India in 1963 and is protected under Schedule I of the Wildlife Protection Act, 1972. The species occurs across a wide range of habitats including deciduous forests, scrublands, agricultural landscapes, and village ecosystems (Yogeshwari & Varunprasath, 2020).

Although the Indian peafowl is considered an adaptable species, its reproductive behaviour is closely associated with environmental conditions such as rainfall, vegetation cover, and food availability. Climatic changes that alter these environmental cues may influence breeding timing, courtship displays, nesting success, and chick survival (Jose & Nameer, 2020). Understanding the potential impacts of climate change on the reproductive ecology of *P. cristatus* is therefore important for predicting long-term population trends and developing appropriate conservation strategies.

2. Distribution and Habitat of *Pavo cristatus* in India

The Indian peafowl is widely distributed throughout the Indian subcontinent and is capable of inhabiting a variety of ecological environments. The species is commonly found in dry deciduous forests, open scrublands, agricultural landscapes, and rural settlements where food resources and suitable nesting sites are available (Kumar et al., 2021).

Northern and western India, particularly states such as Rajasthan, Gujarat, and Uttar Pradesh, support relatively large populations of peafowl. These regions provide semi-arid landscapes and agricultural habitats that offer abundant food resources including grains, seeds, and insects (Singh & Sharma, 2021).

In southern India, the species occurs in states such as Tamil Nadu, Karnataka, and Kerala, where it inhabits scrub forests, plantations, and forest-agriculture mosaic landscapes. Recent studies suggest that the species may be expanding into new regions in response to environmental changes and landscape modification (Jose & Nameer, 2020).

Table 1. Regional distribution and population trends of *Pavo cristatus* in India

Region	Habitat type	Population trend	Ecological factors
Northern India	Agricultural fields, scrub forests	Stable-increasing	Cultural protection and food availability
Western India	Semi-arid landscapes	Increasing	Adaptation to farmland ecosystems
Central India	Dry deciduous forests	Stable	Suitable nesting habitats
Southern India	Plantations and scrub forests	Increasing in some regions	Habitat modification
Eastern India	Forest edges and farmland	Variable	Land-use changes
Northeastern India	Open forest patches	Low density	Dense forest cover

3. Reproductive Biology of the Indian Peafowl

The reproductive behaviour of *Pavo cristatus* is well known for its elaborate courtship displays and distinctive mating system. The species exhibits a polygynous mating pattern, where a single male may mate with several females during the breeding season (Kannan et al., 2021).

Breeding in Indian peafowl usually occurs during the monsoon months from April to September. The onset of rainfall plays an important role in triggering reproductive activity because it leads to increased vegetation growth and food availability (Das et al., 2024).

Female peafowl construct simple ground nests hidden among grasses or shrubs. The clutch size typically ranges from three to eight eggs, and the incubation period lasts approximately 27–30 days. After hatching, the chicks are precocial and capable of moving with the mother shortly after leaving the nest (Ramesh et al., 2022).

Table 2. Breeding biology of *Pavo cristatus*

Parameter	Description
Mating system	Polygynous
Breeding season	April–September (monsoon period)
Courtship behaviour	Feather display, vibration of train feathers, vocal calls
Nest type	Ground nests hidden in vegetation
Clutch size	3–8 eggs
Incubation period	27–30 days
Parental care	Female incubates and cares for chicks
Chick type	Precocial

4. Climate Change and Habitat Modification

Climate change can influence wildlife populations by altering environmental conditions that are essential for survival and reproduction. Rising temperatures and irregular rainfall patterns may affect vegetation growth, water availability, and food resources within ecosystems.

Studies in India have suggested that climate variability may influence the distribution and habitat suitability of Indian peafowl populations (Jose & Nameer, 2020). Changes in vegetation structure may affect nesting sites, while fluctuations in insect populations may influence food availability for chicks.

Table 3. Climate variables affecting reproductive behaviour of *Pavo cristatus*

Climate variable	Influence on reproduction
Temperature rise	Alters breeding timing and activity patterns
Monsoon rainfall	Triggers breeding season and courtship behaviour
Vegetation changes	Influences nesting site availability
Food availability	Affects chick survival
Extreme weather events	Reduces nesting success

5. Influence of Climate Change on Reproductive Behaviour

Breeding Phenology

Breeding phenology in birds is closely associated with climatic conditions. In Indian peafowl, breeding activity generally begins with the onset of the monsoon season. Variations in rainfall timing due to climate change may therefore alter the reproductive cycle of the species

Courtship Behaviour

Courtship displays in peafowl involve the spreading and vibration of the male's train feathers. These displays are influenced by environmental conditions such as humidity and rainfall. Observational studies have shown that display behaviour is most frequent during the monsoon season when environmental conditions are favourable for reproduction (Kannan et al., 2021).

Nesting Success

Ground nesting makes peafowl eggs vulnerable to environmental disturbances. Heavy rainfall, flooding, or drought conditions associated with climate change may damage nests and reduce reproductive success (Ramesh et al., 2022).

6. Conceptual Framework



Figure 1. Conceptual framework illustrating the influence of climate change on habitat conditions and reproductive behaviour of *Pavo cristatus*.



7. Indirect Ecological Effects

Climate change may also influence reproductive success indirectly through ecological interactions. Changes in vegetation structure may alter predator abundance, while fluctuations in insect populations may influence food availability for chicks.

In several regions of India, peafowl populations have adapted to agricultural landscapes where crops and grains provide additional food resources. However, habitat fragmentation and increasing human disturbance may also affect breeding success and nesting behaviour (Kumar et al., 2021).

8. Research Gaps and Future Directions

Research gap	Future direction
Limited long-term climate studies	Long-term monitoring of breeding phenology
Lack of physiological research	Study of thermal stress responses
Regional research imbalance	Comparative studies across Indian ecosystems

9. Conservation Implications

Although the Indian peafowl remains widespread in India, environmental changes may influence its reproductive success and population stability in the future. Conservation strategies should therefore focus on protecting natural habitats, maintaining vegetation cover, and preserving suitable nesting sites.

Long-term ecological monitoring programs are essential for understanding how climate variability affects peafowl populations and for developing climate-adaptive conservation strategies.

10. Conclusion

The Indian peafowl (*Pavo cristatus*) is an ecologically and culturally significant species in India. Although it is currently considered widespread and adaptable, its reproductive behaviour is closely linked with environmental conditions. Climate change, particularly variations in temperature and rainfall patterns, may influence breeding timing, courtship behaviour, and nesting success. Continued research and long-term monitoring are therefore essential to understand the ecological responses of this species to changing climatic conditions and to ensure its conservation in the future.



References

- Bhuva K.J ,Nayi A.;Waghunde R.R.,;Dand J.J & Chaudhary V.(2025) Climate change and Avian vulnerability: A Review of effects on migration,breeding,physiology and conservation *International Journal of Environment and Climate Change* 16(12),766-776 DOI:[10.9734/ijecc/2025/v15i125195](https://doi.org/10.9734/ijecc/2025/v15i125195)
- Choudhary, Narayan & Chishty, Nadim. (2021). Food and feeding preference of indian peafowl (*Pavo cristatus* Linnaeus, 1758) in Barmer district, Rajasthan, India. Multidisciplinary subjects for research-IV, Volume-1(Chapter-18). 10.2021/716200649.18. Red'Shine Publication inc. 7.
- Deepan, Ravichandran & Samson, Arockianathan & Princy, J.. (2021). Population status and conservation threats of Indian peafowl (*Pavo cristatus* linnaeus, 1758) in karur district of tamil nadu, southern india. 15-20
- Das, S., Mukherjee, A., & Ghosh, S. (2024). A study on diurnal activity pattern and time budget analysis of captive Indian peafowl (*Pavo cristatus*) in monsoon,winter and summer seasons at Alipore zoological garden, Kolkata,India *Journal of Biodiversity and Environmental Sciences*, 25(3), 80–93.
- Jeyathilakan, N., Ahamad, D. B., Dhivya, B., & Selvaraj, J. (2024). Occurrence of ectoparasites on a peafowl (*Pavo cristatus*) in Tamil Nadu. *Indian Journal of Veterinary and Animal Sciences Research*, 53(1), 87–90. <https://doi.org/10.56093/ijvasr.v53i1.152423>
- Jose, J., & Nameer, P. O. (2020). The expanding distribution of the Indian peafowl (*Pavo cristatus*) as an indicator of changing climate in Kerala,southern India: A modelling study using MaxEnt. *Ecological Indicators*, 110, 105930. <https://doi.org/10.1016/j.ecolind.2019.105930>
- Kannan, R., Kumar, S., & Murugan, M. (2021). Behavioural ecology and courtship display patterns of Indian peafowl (*Pavo cristatus*). *Journal of Threatened Taxa*, 13(5), 18245–18252. <https://doi.org/10.11609/jott.6345.13.5.18245-18252>
- Kumar, A., Mishra, P., & Singh, V. (2021). Habitat utilization and population density of Indian peafowl in agricultural landscapes of northern India. *Indian Journal of Ecology*, 48(3), 654–660.
- Kumar, A., Sinha, A., & Kanaujia, A. (2021). GIS mapping and distribution of Indian peafowl (*Pavo cristatus*) in India using citizen science data. *International Journal of Zoological Investigations*, 7(2), 310–320. <https://doi.org/10.33745/ijzi.2021.v07i02.004>
- Kumar, V. M. S., Kumar, A., & Patel, M. C. (2024). Identification of Indian peafowl (*Pavo cristatus*) using feather calamus by molecular genetic method. *Journal of Scientific Research and Reports*, 30(8), 83–89. <https://doi.org/10.9734/jsrr/2024/v30i82226>
- Prabha, C. (2023). Foraging and Feeding behaviour of Indian peafowl (*Pavo cristatus*) in wild conditions near human habitations. *Innovation: The Research Concept*, 8(1), 45–50. <https://doi.org/10.5281/zenodo.10605269>



Ramesh, T., Kalle, R., & Sankar, K. (2022). Habitat preference and distribution of Indian peafowl in forest-agriculture mosaic landscapes of the Western Ghats. *Current Science*, 122(4), 476–482.

Senthilkumar, S., Kumar, R., & Rajendran, P. (2024). Incidence of ecto- and endoparasites in Indian peafowls (*Pavo cristatus*) from the Cauvery delta region of Tamil Nadu. *Indian Journal of Veterinary and Animal Sciences Research*, 54(3). <https://doi.org/10.56093/ijvasr.v54i3.167498>

Sharma, A., & Gupta, R. (2022). Behavioural responses of Indian peafowl to environmental variables in central India. *Indian Journal of Ecology*, 49(2), 513–520.

Singh, R., & Sharma, V. (2021). Population ecology and breeding behaviour of Indian peafowl in semi-arid landscapes of Rajasthan. *Journal of Wildlife Research*, 9(2), 45–52.

Singh, R., & Lata, S. (2025). Study of population and distribution of Indian peafowl (*Pavo cristatus* L.) during COVID-19 In penghore (Saman) bharatpur Rajasthan. *International Journal of Creative Research Thoughts*, 13(4), 320–328.

Subramanian, C., Rameshkumar, C., & Kalaiyarasi, G. (2024). Status and distribution of Indian peafowl (*Pavo cristatus*) in different altitudinal gradients & habitata in the eghamalai forests, Western Ghats of Tamil Nadu. *Journal of Ecology and Natural Resources*, 8(3). <https://doi.org/10.23880/jenr-16000159>

Yogeshwari, M., & Varunprasath, K. (2020). Status and distribution of Indian peafowl (*Pavo cristatus*) in South Coimbatore, Tamil Nadu, India. *Journal of Scientific Research and Reports*, 26(1), 1–7. <https://doi.org/10.9734/jsrr/2020/v26i130207>