

Ecological imbalances affect the population of peafowl, jackal and giant honeybee colonies in Palakkad district, Kerala, India*

Pradeep Balan

*The peafowl (*Pavo cristatus*), jackal (*Canis aureus*) and giant honeybee (*Apis dorsata*) colonies in rural areas of Palakkad district, Kerala, part of the southern Western Ghats of India, have changed significantly due to ecological imbalance. Nowadays, there are more peafowl and no jackals are spotted in the area; giant honeybee colonies are also rare. This may be due to human activities such as agricultural expansion, the use of agrochemicals, construction activities, urbanization and loss of vegetation. These factors may have led to habitat loss, which has affected the ecological balance ultimately affecting the population of these species. Ecological restoration can help regulate the populations of these species. There is a need for detailed scientific studies and expert intervention to address this ecological imbalance and population changes of these species in the study area.*

In nature, there is an ecological balance of various species; an imbalance in it will affect the ecosystem stability¹. Living in the foothills of the southern Western Ghats in Kerala, India, for the past 35 years, the present author has noticed that the population of three species has changed significantly. The geographical location of the study area lies between 76°29'31.8"–76°34'24"E long. and 10°41'8.9"–10°44'30.7"N lat., in the rural areas of Palakkad district, Kerala. The peafowl (*Pavo cristatus*) population in the area has increased and they can be seen every day. The jackals (*Canis aureus*) have disappeared, and the number of giant bee (*Apis dorsata*) colonies has declined (Figure 1). Based on the observed changes, it is hypothesized that as a result of human intervention, the ecological balance of the area has been altered and ultimately affected the populations of these species. Anthropogenic pressure is a causative factor for ecological imbalance². According to the Kerala Government census, the human population of the state has increased from 1.69 to 3.34 crores between 1961 and 2011. Over the past 50 years, humans have encroached upon the foothills of the Western Ghats in Kerala to cultivate crops and construct buildings leading to vegetation loss, habitat degradation, and alteration of the pristine southern Western Ghats region^{3–5}. Due to the expansion of agriculture, deforestation and other development activities in the area, the habitats of various species have been degraded, ultimately affecting their ecological balance.

These observations are supported by published scientific studies from Kerala. It has been reported that peafowl populations have increased in the state and this poses a threat to agriculture, people and the environment^{6,7}. Despite being declared as the national bird of India, the peafowl is now a threat to rice growers in Kerala. Groups of peafowl enter the fields and destroy the sown seeds, causing man–bird conflicts. According to a study⁶, 19% of Kerala's area is suitable habitat for this species, which could increase by 40–55% by 2050. Peafowls is an arid land species, an indicator of drought, and are sensitive to deforestation and climate change. According to reports, the jackal population in Kerala has declined⁸. Jackals hunt for eggs and hatch-

lings of peafowl. As a result of the decline in jackal population, the peafowl population in the state has increased. This may also be due to the decline in the number of predator species controlling the peafowl population⁹. However, there is no scientific evidence to support this fact. The reason for the decline in jackal population in the state may be habitat loss and climate change, but in-depth research is needed in this direction. Habitat loss is a causative factor that determines the population of various species¹⁰. Animals (elephants and wild boars) have entered human territory, which is not uncommon in the southern Western Ghats of Kerala as humans encroach upon the forest edges for agriculture.

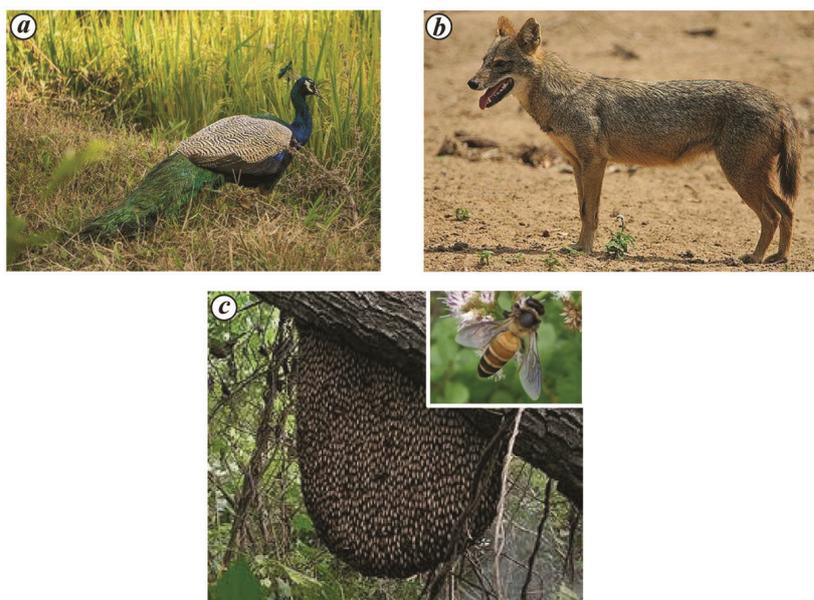


Figure 1. Representative images: **a**, Peafowl (*Pavo cristatus*); **b**, jackal (*Canis aureus*); **c**, giant honeybee colony (inset, *Apis dorsata*).

*The views expressed here are solely those of the author's and not the affiliated organization.

Today, agriculture in the foothills of the southern Western Ghats in Kerala has changed to monoculture¹¹. Agrochemicals are used to control plant pests and diseases that affect species and their habitats¹². The use of pesticides in agriculture can affect the nesting niche of honeybees. Since honeybees are bio-indicators and are sensitive to ecological changes, excessive and prolonged use of pesticides in agriculture will irreversibly affect their population. There have been reports of reduction in giant bee colonies due to the use of pesticides on cardamom plantations in Idukki district, part of the Western Ghats area of Kerala¹³. Another study has shown that the increasing number of cell-phone towers and electromagnetic radiation can pose a threat to honeybees¹⁴. Scientific studies published on this subject are limited, although the opinions expressed in this note are in agreement with the published literature, indicating that ecological imbalance due to human interference has influenced the population dynamics of these three species in the study area. These observations relate to only three species based on the present author's experience living in the study area for several years, but further research is needed to prove these observations.

The increase or decrease in population of a particular species may be due to an imbalance in the ecosystem. It is important

to address the ecological imbalance of various species in the Western Ghats of Kerala. Ecological imbalance is caused by factors such as urbanization, loss of biodiversity, habitat degradation and climate change due to human interference. This can affect the proper functioning of ecosystems, ultimately affecting the population of various species, including human well-being. Therefore, ecological restoration of the Western Ghats plays a key role in regulating or balancing the population of different species. Further scientific research and expert involvement is needed to restore the ecological stability of the population of various species in the southern Western Ghats of Kerala.

1. McCann, K. S., *Nature*, 2000, **405**, 228–233.
2. Galvani, A. P., Bauch, C. T., Anand, M., Singer, B. H. and Levin, S. A., *Proc. Natl. Acad. Sci. USA*, 2016, **113**(51), 14502–14506.
3. Chandrasekara, U. M., Muraleedharan, P. K. and Sibichan, V., *J. Mt. Sci.*, 2006, **3**, 58–70.
4. Jha, C. S., Dutt, C. B. S. and Bawa, K. S., *Curr. Sci.*, 2000, **79**(2), 231–237.
5. Ramachandran, R. M. and Reddy, C. S., *J. Indian Soc. Remote Sensing*, 2017, **45**, 163–170.
6. Jose, V. S. and Nameer, P. O., *Ecology*, 2020, **110**, 105930.
7. Ranjith, V. and Jose, B., *Curr. Sci.*, 2016, **110**(11), 2177–2182.

8. <https://www.thehindu.com/sci-tech/energy-and-environment/an-online-survey-on-the-jackal-seeks-to-find-out-if-the-animal-is-disappearing-from-keralas-countryside/article33615623.ece> (accessed on 26 September 2021).
9. <https://www.downtoearth.org.in/blog/wild-life-biodiversity/should-we-celebrate-the-spread-of-peafowl-in-india-72643> (accessed on 26 September 2021).
10. Radic, B. and Gavrilovic, S., In *Life on Land. Encyclopedia of the UN Sustainable Development Goals* (eds Leal Filho, W. et al.), Springer, Cham, Switzerland, 2021, pp. 1–14; https://doi.org/10.1007/978-3-319-95981-8_6.
11. Kumar, B. M., *J. Trop. Agric.*, 2005, **42**(1–2), 1–12.
12. Hedge, G., Krishnamurthy, S. V. and Berger, G., *Chem. Ecol.*, 2019, **35**(5), 397–407.
13. <https://timesofindia.indiatimes.com/city/kozhikode/dip-in-honeybees-population-could-hit-food-security-study/articleshow/29981475.cms> (accessed on 26 September 2021).
14. Sahib, S. S., *J. Hortic. For.*, 2011, **3**(4), 131–133.

Pradeep Balan is in the Rubber Research Institute of India, Ministry of Commerce and Industry, Government of India, Rubber Board Post, Kottayam 686 009, India. e-mail: pradeepbgis@gmail.com