

## Harmony in the fields: millet cultivation's resurgence as a beacon of hope for declining bird populations

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*In the face of alarming global decline in bird species highlighted by the 2023 IUCN Red List and a parallel trend in India reported by the 2023 State of India's Birds, this write-up explores the multifaceted threats posed by factors such as agriculture intensification, hunting and land degradation. Emphasizing the critical role of birds in ecosystems, the article delves into the complex motivations behind bird feeding, drawing attention to historical ecological imbalances resulting from misguided interventions. Proposing a solution, the authors advocate for the resurgence of millet cultivation as a sustainable agricultural practice, demonstrating its potential to enhance farmland bird population and promote biodiversity. The comprehensive nutritional and habitat benefit of millet fields for various bird species, underscores the potential for a harmonious coexistence of agriculture and avian conservation.*

The 2023 IUCN Red List serves as a stark reminder of the unprecedented global loss of bird species<sup>1</sup>. The 2023 status report on State of India's Birds reveals that approximately 60 per cent of the birds in India have experienced a decline in population over the past 30 years<sup>2</sup>. This alarming trend is exacerbated by various factors, including agricultural intensification, hunting, trade, land degradation and pesticide use. Farmland birds face severe threats worldwide, leading to rapid and sustained population decline. The areas dominated by agriculture emerge as the habitat, witnessing the most significant decline in bird populations, and the primary driver of this decline is agricultural intensification, resulting in habitat loss and reduced food sources for birds<sup>3,4</sup>. Birds are essential contributors to ecosystem, providing four key services: provisioning, regulating, cultural and supporting, as identified by the UN Millennium Ecosystem Assessment<sup>5,6</sup>. Within ecosystems, birds play various roles, such as predators, pollinators, scavengers, seed dispersers, seed predators and ecosystem engineers. These services can be grouped into two categories: those stemming from bird behaviour, such as pest control in agriculture, and those resulting from bird products, such as nests and guano. Many people worldwide observe, feed, and find artistic and spiritual inspiration in birds. However, the economic importance of birds is often overlooked, and the societal economic impact of their ecological roles is not well understood<sup>7</sup>.

Jones' discussion underscores considerable uncertainty associated with the fundamental question of what motivates people to feed birds<sup>8</sup>. While common reasons include pleasure, providing food, and observing birds up close, only a few studies have

delved deeper into the motivations behind this practice. One study found that ethical or moral reasons, such as wanting to give back to nature, play a role in people's decision to feed birds. Another study echoed similar motivations, emphasizing feelings of protection and attachment to the birds. These findings suggest that bird feeding is a more complex and emotionally charged activity than it may seem superficially. Additionally, the practice deserves greater attention as it represents a primary form of human-wildlife interaction in the contemporary world. The tragic repercussions of an ill-conceived sparrow killing campaign in 1958 China, grounded in the belief that sparrows consumed vital food grains, resulted in a profound ecological imbalance. This misguided initiative, alongside other contributing factors, played a substantial role in unfolding the Great Chinese Famine of 1959–1961, ultimately causing the loss of up to 45 million lives<sup>9</sup>.

Given the vital role of millets, several tropical countries, including India and Bangladesh, have intensified efforts in millet cultivation. The Food and Agricultural Organization of the United Nations designated 2023 as the 'International Year of Millets'. India aims to position itself as the 'global hub for millets' and transform 2023 into a 'people's movement' for millet promotion. As a promising alternative amid challenges such as food insecurity, malnutrition, agrarian distress and climate change, millet production gains significance. We posit that the global resurgence and promotion of millet cultivation could be a pivotal catalyst for the sustained enhancement of the farmland bird population. Indeed, millet cultivation, deeply rooted in traditional farming practices, emerges as a

powerful tool for restoring natural habitats, emphasizing biodiversity and overall ecosystem health. The reintroduction of millet cultivation on a larger scale not only reflects a return to sustainable agricultural methods but also holds the potential to transform landscapes into thriving havens for avian life. Incorporating millet into agricultural landscapes brings about a multifaceted enhancement of habitats, catering to the diverse needs of bird species.

Millets are categorized within nine distinct genera of the Poaceae family, commonly known as the grass family. The cultivation of millet creates a tapestry of vegetation, ranging from the towering stalks of mature millet plants to the rich undergrowth, providing an array of micro-environments for birds to nest, forage and find respite. At least 34 species of birds enjoy millets. The tall and robust characteristics of certain millet species provide an optimal habitat for numerous bird species. Abundant food resources and suitable shelter transform millet landscapes into crucial stopover points, supporting birds on their arduous migratory routes.

Moreover, millet fields serve as a crucial food source for a diverse range of farmland bird species. The grains and seeds produced by millet plants offer nutritious sustenance throughout various stages of birds' life cycle, particularly during pivotal periods such as breeding and migration. Notably, small grain mixtures, mainly millets, form the foundation of bird nutrition<sup>10</sup>. The comprehensive assortment of grains and seeds not only addresses the nutritional needs of granivorous birds, but also plays a vital role in supporting their overall well-being, emphasizing the symbiotic relationship between millet cultivation and avian conservation.

Worldwide, a minimum of 150 insect species are known to feed on millets<sup>11</sup>. This highlights that millet fields not only serve as food for granivorous birds but also constitute a valuable source of sustenance for insectivorous birds. In addition, millet crops indirectly support endangered prey birds by providing a habitat for the prey species. As carnivores, prey birds or raptors rely on small mammals, birds and insects for sustenance. Millet fields enhance local biodiversity, attracting a diverse range of small animals that become potential prey for the endangered raptors. Nonetheless, millet cultivation typically relies on low-input and organic farming methods, minimizing the use of synthetic fertilizers and pesticides. This eco-friendly approach reduces the risk of harmful chemical residues in the environment, benefiting not only birds but also other wildlife and human populations.

Maintaining and preserving avian biodiversity is essential for the overall health and balance of our ecosystems. Adopting millet cultivation practices can help secure a reliable food source for farmland birds

while contributing to the preservation and restoration of their natural habitats. This, in turn, fosters a more balanced and ecologically sustainable coexistence between agriculture and avian biodiversity, presenting a promising approach to addressing environmental concerns.

*Disclaimer:* The opinions are solely of the authors and not necessarily of the organizations they are affiliated with.

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