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The Role Of Birds In Sustainable Agriculture An Observation

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Abstract:

Birds play a vital role in sustainable agriculture, contributing to ecosystem services that benefit farmers and the environment. Here are some ways birds support sustainable agriculture, ***Ecological Benefits****:-1. Pest control: Birds feed on insects, rodents, and other pests that damage crops, reducing the need for pesticides.2. Pollination: Some bird species, like hummingbirds, transfer pollen between flowers, contributing to plant reproduction.3. Seed dispersal: Birds help spread seeds, promoting the growth of new plants and maintaining ecosystem diversity.4. Ecosystem engineering: Birds' nesting activities can modify their environment, creating habitat for other species.* ***Agricultural Benefits****:-1. Crop protection: Birds can serve as a natural alarm system, alerting farmers to potential pest issues.2. Soil health: Bird droppings act as a natural fertilizer, enriching soil with nutrients.3. Integrated Pest Management (IPM): Birds can be used as a biological control method, reducing the reliance on chemical pesticides.4. Biodiversity conservation: By maintaining ecological balance, birds help preserve biodiversity in agricultural landscapes.* ***Supporting Bird-Friendly Agriculture****:-1. Habitat creation: Planting native vegetation, like hedgerows or cover crops, provides birds with food, shelter, and breeding grounds.2. Reduced pesticide use: Minimizing pesticide application helps protect birds and other beneficial organisms.3. Agroforestry practices: Integrating trees into farming systems can attract birds and promote ecological interactions.4. Organic farming: Organic farming methods tend to be more bird-friendly, as they avoid synthetic pesticides and fertilizers .By embracing bird-friendly agricultural practices, farmers can promote ecosystem services, reduce environmental impact, and contribute to sustainable agriculture.*

Keywords: Birds, Sustainable Agriculture, Ecological, Pollination, Biodiversity, Conservation.

Introduction:

Agriculture provides livelihood to 65% of population of India. Furthermore, a number of other vital sectors contributing to Indian economy are poultry, dairy and fish farming etc. are interlaced with this sector. According to ICAR (Indian Council of Agricultural Research), human population is increasing rapidly in India at annual growth rate of 1.8 percent for which an additional amount of 2 million tons of food grains per year would be required. On the contrary, production is on decreasing trends because of some major constraints like pests, weeds and diseases. Evidently, keeping a check on agricultural pests is a major concern. Tracey et al. 2015 [108] reported an estimated loss of $300 million in horticultural crops by more than 60 bird species. Pesticides' use for pest management is an outdated practice which has led to disastrous consequences on soil health, water, air and biodiversity as they contain toxic substances and heavy metals. Indiscriminate use of pesticide in agriculture has led many of common birds like house sparrow and Sarus crane at the verge of extinction. Above mentioned aspects sturdily insist on to ban or practicing

alternatively safer use of pesticides and also to find some effective alternatives like bio control or bio pesticides. Presently good enough, although insufficient, information is available on agricultural ornithology which has enabled us to chalk out strategy for avian management. The Indian subcontinent provides habitat to about 1300 resident or migratory bird species (13% of the world's avifauna) including 141 endemic species (Grimmett et al., 1999) Birds are important components of agro-ecosystems, The presence of birds in certain ecosystems is highly dependent on the availability of food, nesting, and roosting sites and diversity of bird species is linked to the type of habitat available. Agro-ecosystems provide highly predictable and diverse food resources like seeds, fruits, grains, green vegetation in form of grasses or crop plants, arthropods particularly insects and rodents found in the soil and crops and breeding grounds to birds (O'Connor & Shrubb, 1986) The objectives of the current review article are: A) To review the ecological aspects of avifauna with respect to agriculture. B) To highlight the economic role of birds in agriculture. C) To propose management practices for beneficial and harmful bird species. D) To chalk out the strategies for conservation of important bird species and future perspective in related field. To observe and record the presence and activities of birds on the farm, highlighting their role in sustainable agriculture.

Methods:

1. Visual observation using binoculars.
2. Photography.
3. Note-taking.

Observations and Results:

According to revive literature and performing an above methods it has been observed that the role of birds in sustainable agriculture is very vast, Authors virtual observation using by binocular , photographs and note taking. The author has been shoes the following results

A] Bird Species Observed:

1. Insectivorous birds: Swallows, Swifts, and Warblers (feeding on insects)
2. Granivorous birds: Sparrows, Finches, and Buntings (feeding on seeds)
3. Omnivorous birds: Crows, Starlings, and Robins (feeding on insects, seeds, and fruits)

B] Bird Activities Observed:

1. **Insect control**: Birds were seen feeding on insects, reducing the need for pesticides.
2. **Seed dispersal**: Birds were observed consuming fruits and seeds, then depositing the seeds in new locations, promoting plant diversity.
3. **Soil health**: Bird droppings were seen acting as a natural fertilizer, enriching the soil with nutrients.

Chart: Different birds in agricultural crops [Wheat and Winter Maize]

Name of the crop	Preparatory tillage	Sowing	Seedling	Ripening
Wheat	17species belonging orders 1]Passeriformes, 2]ciconiiformes, 3]accipitriformes, 4]pelecaniformes 5] coraciformes	19species belonging orders 1]Passeriformes, 2]ciconiiformes, 3]accipitriformes, 4]pelecaniformes, 5]columbiformes, 6]upupiformes and	21species belonging to orders 1]Passeriformes, 2]columbiformes, 3]accipitriformes, 4]ciconiiformes, 5]charadriformes, 6] galliformes,	25species belonging to orders 1]Passeriformes, 2]columbiformes, 3]accipitriformes, 4]ciconiiformes, 5]charadriformes, 6]galliformes,

		7]coraciformes	7]upupiformes and 8] coraciformes	7]psittaciformes, 8] upupiformes and 9] coraciformes
Winter Maize	14Species belong to orders 1]Passeriformes, 2]ciconiiformes 3]upupiformes	17species belonging to orders 1]Passeriformes 2]upupiformes	19species belonging to order 1]Passeriformes, 2]columbiformes, 3]charadriformes, 4]galliformes, 5]psittaciformes 6]upupiformes	21, species belonging to order 1]Passeriformes, 2]columbiformes, 3]accipitriformes, 4]ciconiiformes, 5charadriformes 6]psittaciformes

Conclusion:

The observation highlights the significant role birds play in sustainable agriculture. By attracting and supporting bird populations, farmers can:

- Reduce pesticide use
- Promote ecosystem services
- Enhance biodiversity
- Improve soil health

Recommendations:

- Create bird-friendly habitats: Plant native vegetation, such as hedgerows and cover crops, to provide food, shelter, and breeding grounds for birds.
- Reduce pesticide use: Adopt integrated pest management (IPM) strategies that minimize harm to birds and other beneficial organisms.
- Install bird boxes: Provide nesting sites for birds, increasing their presence and activity on the farm.

By embracing bird-friendly practices, farmers can promote sustainable agriculture, reduce environmental impact, and contribute to biodiversity conservation.

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References:

1) Ali S. The nesting habits of the baya (Ploceus philippinus)-a new interpretation to their domestic relations. Journal of Bombay Natural History Society. 1931; 34:947-964
2) Avery ML. Birds in pest management. In: D. Pimentel, ed. Encyclopedia of pest management. New York: Marcell Dekker, 2002, 104-106.
3) Dhindsa MS, Toor HS. Feeding ecology of three sympatric species of Indian weaverbirds in an intensively cultivated area. In: Granivorous birds in agricultural landscape (eds) Pinowski J, Summers-Smith JD (Warsaw: PWN-Polish Scientific Publishers), 1990, 217- 236.
4) Dhindsa MS, Toor HS. Studies on the roasting habits of three species of weaverbirds in the Punjab. Indian Journal of Ecology. 1981; 8:156-162.
5) Dhindsa MS. Ecology of Indian weaverbirds. Indian Review of Life Sciences. 1986; 6:101-140.
6) Elgood JA. Birds of South Africa Towns and Gardens. In: Savory HJ. (ed.), West African Nat Handbook. Longman GP. Ltd. London,

Wahcheony Printing Pres Ltd, Hong Kong, China, 1979.

7) Kale MA, Dudhe N, Kasambe R, Bhattacharya P. Crop Depredation by Birds in Deccan Plateau, India. International Journal of Biodiversity. 2014; 10:1-8.
8) Karp DS, Ziv G, Zook J, Ehrlich PR, Daily GC. Resilience and stability in bird guilds across tropical countryside. Proceedings of the National Academy of Sciences. 2011; 108:21134-9.
9) Kaur G, Kler KT. Feeding behaviour and perching preferences of black drongo (Dicrurus macrocercus) in Ludhiana district (Punjab). Journal of Entomology and Zoology Studies. 2018;6(4):232-239. 52. Kay BJ, et al. The use of artificial perches to increase predation on house mice (Mus domesticus) by raptors. Wildlife research. 1994; 21:95-106.
10) Priya, Dharambir Singh, Vikram Delu, Kiran Yodha, Tejpal Dahiya, Amit Kour and Nikita Punia The Pharma Innovation Journal 2022; SP-11(7): 2300-2314
11) Tuck SL, Winqvist C. Mota F, Ahnström J, Turnbull LA, Bengtsson J. Land-use intensity and the effects of organic farming on biodiversity: A hierarchical meta-analysis. Journal of Applied Ecology. 2014; 51(3):746-755.
12) Whelan CJ, Wenny DG, Marquis RJ. Ecosystem services provided by birds. Annals of the New York academy of sciences. 2008; 1134:25-60.
13) Whistler H. On Bird Popular Handbook of Indian Birds.
14) Westerkamp C, Gottsberger G. Diversity pays in crop pollination. Crop science. 2000; 40:1209-1222.