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ASSESSMENT ON AVIAN DIVERSITY, THREATS AND CONSERVATION MEASURES IN URBAN AND RURAL HABITATS OF BISHNAH TEHSIL OF JAMMU, JK (UT), INDIA

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ABSTRACT

The present study assessed the avian diversity, habitat preferences, major threats, and conservation measures in the urban and rural habitats of Bishnah Tehsil, Jammu, Jammu and Kashmir (UT), India. A total of 50 bird species belonging to diverse taxonomic groups were recorded. Rural habitats supported significantly higher bird diversity than urban habitats, reflecting the importance of heterogeneous landscapes in maintaining avian communities. Based on local abundance, 25 species (50%) were categorized as common, 19 species (38%) as uncommon, and 6 species (12%) as rare. The avifauna was dominated by resident species (93%), while winter migrants (5%) and summer migrants (2%) constituted a smaller proportion of the assemblage. The study identified habitat loss, urbanization, wetland degradation, intensive agricultural practices, pollution, and climate change as the major threats affecting bird diversity in the region. Conservation measures such as habitat protection and restoration, wetland conservation, sustainable agricultural practices, afforestation, public awareness, and long-term ecological monitoring are recommended to safeguard avian biodiversity.

KEYWORDS: *Avian diversity; Bishnah; Bird conservation; Urban habitat; Rural habitat; Wetland; Habitat loss; Resident birds; Migratory birds; Jammu and Kashmir.*

INTRODUCTION

The avifaunal diversity of Jammu and Kashmir has been extensively studied by several researchers includes Ripley (1982), Ali and Ripley (1987), Ali (2002), Sharma and Saini (2014), Jamwal *et al*. (2017), Sohil and Sharma (2019, 2020), Kait *et al*. (2013, 2014, 2017), Asgher *et al*. (2021), Kumar and Kaur (2023), Among them, Kait *et al*. has made significant contributions towards documenting bird diversity in different habitats of the region. Kait *et al*. (2017) recorded 90 bird species belonging to 39 families from the Trikuta Hills and emphasized the role of habitat diversity in maintaining avian richness. Hussain and Kait (2013) documented 82 bird species from Mendhar area of Poonch district and reported that habitat heterogeneity plays an important role in supporting diverse bird communities. Similarly, Singh *et al*. (2013) recorded 55 bird species from the Patnitop Development Authority area, while Kait *et al*. (2014) documented the bird diversity of Srinagar city and highlighted the ecological significance of urban green spaces for avian conservation. Due to their sensitivity to environmental changes, birds are widely recognized as reliable indicators of habitat quality and ecosystem health (Gregory & van Strien, 2010). Kumar and Kaur (2023) documented 104 avian species from different habitats of suburban area of district Udhampur. Therefore, studies on avian diversity are widely used to assess the ecological status and environmental quality of a region.

The Jammu region of Jammu and Kashmir is characterized by a variety of habitats including forests, agricultural fields, wetlands, grasslands, riverbanks, and urban settlements (Sharma & Saini, 2014). These diverse habitats support a rich assemblage of resident and migratory bird species (Kour & Sahi, 2013). Bishnah subdivision, situated in the plains of Jammu district, represents a heterogeneous landscape where traditional rural agricultural ecosystems coexist with rapidly expanding urban settlements. Such habitat diversity provides suitable opportunities for investigating patterns of avian diversity, abundance, and distribution (Wiens, 1989). Urbanization is considered one of the leading causes of biodiversity loss worldwide (McKinney, 2008).

The village of Karail Manhasan and its surrounding areas in Bishnah contain a mosaic of croplands, open fields, water bodies, village settlements, and roadside vegetation that support diverse bird communities. Despite the availability of studies from various parts of Jammu and Kashmir, comparative investigations focusing specifically on urban and rural habitats of Bishnah remain limited. Therefore, the present study aims to assess and compare avian diversity in urban and rural habitats of Bishnah, Jammu. The study also seeks to identify common and rare bird

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species, evaluate habitat preferences, and examine the influence of environmental factors on bird distribution.

MATERIALS AND METHODS

The study area of Bishnah tehsil was divided into different habitat categories based on land-use patterns and vegetation characteristics. The study area lies at 32.6106° N and 74.8556° E at an average elevation of approximately 286 m above sea level. Habitats were broadly classified as Rural Habitat, Urban Habitat, Agricultural Fields, Wetlands, and Mixed Habitat Areas. Bird species recorded from villages, farmlands, and open countryside were categorized under rural habitats, whereas species observed in residential colonies, markets, roadsides, and built-up areas were classified under urban habitats. Species occurring in both habitat categories were recorded as inhabiting mixed habitats.

Field surveys were conducted using point count and line transect methods. Birds were observed during morning and evening hours when avian activity is highest. Binoculars, notebooks, mobile cameras, and bird identification guides were used during the survey. Species identification was done using field guides and online databases. Observations were recorded systematically and analyzed to compare species diversity in different habitats.

Bird observations were conducted during three different periods of the day: morning (06:00–09:00 h), daytime (random), and evening (16:00–18:30 h). Repeated visits were made to the selected study sites to ensure comprehensive documentation of the avifauna and to minimize sampling bias.

Various field equipment, including binoculars (10×50), field notebooks, digital/mobile cameras, and bird identification guides, were used during the surveys. Species identification was performed based on morphological characteristics such as plumage colour, body size, flight pattern, calls, and habitat preference. Identification was further verified using standard field guides by Grimmett *et al*. (2011) and online ornithological databases whenever required.

The local abundance status of bird species was determined following the classification proposed by Srinivasa and Nagulu (2002). Species were categorized based on their frequency of occurrence and number of sightings during the survey period.

Common (C): Species observed regularly and abundantly during most field visits throughout the study period.

Fairly Common (FC): Species observed frequently but not during every survey visit.

Uncommon (UC): Species recorded occasionally and generally represented by relatively few individuals.

Rare (R): Species encountered infrequently and recorded only during a limited number of survey visits.

The abundance categories were used to assess the relative status and distribution of bird species within the study area. This classification facilitated comparison among habitats and provided insights into species occurrence patterns and habitat associations.

RESULTS AND DISCUSSION

The present study was conducted to compare avian diversity between urban and rural habitats of Bishnah, Jammu. A total of 50 avian species were documented from the study area (Table 1). The study revealed noticeable differences in species composition, abundance, and diversity between the two habitat types. The results indicate that rural habitats support greater avian diversity than urban habitats.

Table 1. Systematic list of avian species recorded in the study area.

S No.	Common Name	Scientific Name	Local Abundance Status	Habitat	Occurrence
1	House Sparrow	*Passer domesticus*	Common	Both	Resident
2	Common Myna	*Acridotheres tristis*	Common	Both	Resident
3	Jungle Myna	*Acridotheres fuscus*	Common	Rural	Resident
4	Bank Myna	*Acridotheresginginianus*	Common	Rural	Resident
5	Red-vented Bulbul	*Pycnonotus cafer*	Common	Both	Resident
6	Red-whiskered Bulbul	*Pycnonotus jocosus*	Uncommon	Rural	Resident
7	Indian Robin	*Saxicoloides fulicatus*	Common	Rural	Resident
8	Oriental Magpie Robin	*Copsychus saularis*	Common	Both	Summer Migrant
9	Asian Koel	*Eudynamys scolopaceus*	Common	Both	Resident
10	Rose-ringed Parakeet	*Psittacula krameri*	Common	Both	Resident
11	Black Drongo	*Dicrurus macrocercus*	Common	Rural	Resident
12	Ashy Drongo	*Dicrurus leucophaeus*	Uncommon	Rural	Resident
13	White-throated Kingfisher	*Halcyon smyrnensis*	Common	Both	Resident
14	Common Kingfisher	*Alcedo atthis*	Uncommon	Rural	Resident
15	Green Bee-eater	*Merops orientalis*	Common	Rural	Resident
16	Pied Bush Chat	*Saxicola caprata*	Common	Rural	Resident
17	Cattle Egret	*Bubulcus ibis*	Common	Rural	Resident
18	Little Egret	*Egretta garzetta*	Common	Rural	Resident
19	Intermediate Egret	*Ardea intermedia*	Uncommon	Rural	Resident

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20	Indian Pond Heron	*Ardeola grayii*	Common	Rural	Resident
21	Grey Heron	*Ardea cinerea*	Uncommon	Rural	Resident
22	Black-crowned Night Heron	*Nycticorax nycticorax*	Rare	Rural	Resident
23	Purple Heron	*Ardea purpurea*	Rare	Rural	Resident
24	Rock Pigeon	*Columba livia*	Common	Urban	Resident
25	Eurasian Collared Dove	*Streptopelia decaocto*	Common	Both	Resident
26	Laughing Dove	*Spilopelia senegalensis*	Common	Rural	Resident
27	Spotted Dove	*Spilopelia chinensis*	Common	Both	Resident
28	House Crow	*Corvus splendens*	Common	Urban	Resident
29	Large-billed Crow	*Corvus macrorhynchos*	Common	Both	Resident
30	Indian Peafowl	*Pavo cristatus*	Common	Rural	Resident
31	Shikra	*Accipiter badius*	Uncommon	Both	Resident
32	Black Kite	*Milvus migrans*	Common	Both	Resident
33	Brahminy Starling	*Sturnia pagodarum*	Uncommon	Rural	Resident
34	Plain Prinia	*Prinia inornata*	Common	Rural	Resident
35	Yellow-footed Green Pigeon	*Treron phoenicoptera*	Uncommon	Rural	Resident
36	Barn Owl	*Tyto alba*	Rare	Rural	Resident
37	Spotted Owlet	*Athene brama*	Uncommon	Both	Resident
38	Eurasian Hoopoe	*Upupa epops*	Uncommon	Rural	Resident
39	Common Sandpiper	*Actitis hypoleucos*	Rare	Rural	Winter Migrant
40	White Wagtail	*Motacilla alba*	Uncommon	Both	Winter Migrant
41	Common Cuckoo	*Cuculus canorus*	Uncommon	Rural	Occasional
42	Pied Kingfisher	*Ceryle rudis*	Uncommon	Rural	Occasional
43	Common Tailorbird	*Orthotomus sutorius*	Uncommon	Rural	Occasional
44	Eurasian Tree Sparrow	*Passer montanus*	Uncommon	Rural	Occasional
45	Brown Shrike	*Lanius cristatus*	Uncommon	Rural	Occasional
46	Black Redstart	*Phoenicurus ochruros*	Uncommon	Rural	Occasional
47	Bluethroat	*Luscinia svecica*	Rare	Wetland	Occasional
48	Indian Pitta	*Pitta brachyuran*	Rare	Rural	Occasional
49	Little Grebe	*Tachybaptus ruficollis*	Uncommon	Wetland	Occasional
50	Great Egret	*Ardea alba*	Uncommon	Rural	Occasional

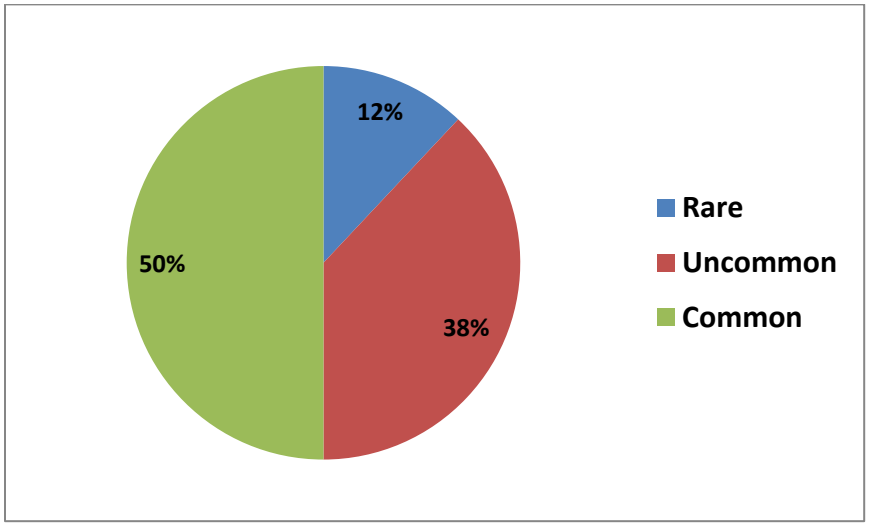

Figure 1. Status wise distribution of bird species recorded from Bishnah, Jammu.

Abundance Status of the avifaunal species revealed that out of total 50 species documented during the study, 25 number of species were common and constituted the largest proportion (50%) of the avifauna reported, followed by 19 (38%) uncommon species and 6 (12%) rare species (Fig. 1). The avifauna of Bishnah, Jammu, consists of 93% resident, 5% winter migrant, and 2 % summer migrant bird species (Fig. 2). The diversity of habitats in the area, including agricultural fields, wetlands, ponds, and human settlements, provides suitable feeding, breeding, and roosting grounds for both resident and migratory birds. Migratory

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birds use these habitats seasonally, while resident species remain throughout the year. Resident birds are those that occur in the study area throughout the year and complete their life cycle locally. These species are well adapted to the environmental conditions of Bishnah and can be observed during all seasons. Examples include House Sparrow, Common Myna, Red-vented Bulbul, Black Drongo etc. Winter migrants are species that visit Bishnah during the winter season, generally from October to March. These birds migrate from northern regions such as Central Asia, Siberia, and other temperate areas to escape harsh winter conditions and utilize the food-rich wetlands and agricultural habitats of Jammu. Examples include Bar-headed Goose, Northern Pintail, Northern Shovel, Common Teal, Gadwall, Eurasian pigeon. Summer migrants are species that arrive in the region during the summer months, mainly for breeding purposes. These birds are generally present from spring to early autumn. Examples include**:**Asian Koel, Indian Golden Oriole, Blue-tailed Bee-eater and Pied Cuckoo.

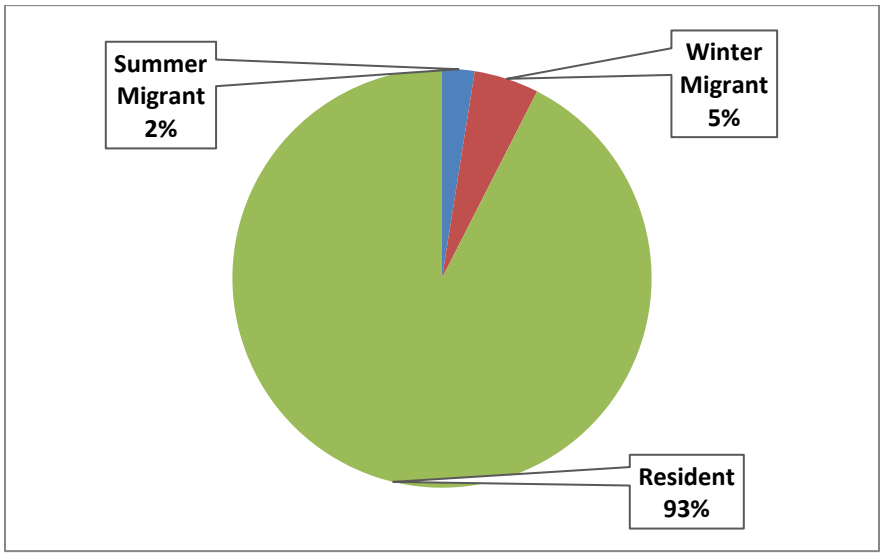

Figure 2. Migratory Species of birds recorded from Bishnah, Jammu showing the dominance of resident species (92.5%), followed by winter migrants (5.0%) and summer migrants (2.5%).

Threats to Bird Diversity

Bird diversity in Bishnah, Jammu, is influenced by a variety of environmental and anthropogenic factors that pose significant threats to the survival and distribution of avian species. The study area supports a rich assemblage of resident and migratory birds due to the presence of agricultural lands, wetlands, ponds, trees, and human settlements. However, increasing human activities and environmental degradation have adversely affected the quality and availability of bird habitats.

One of the major threats to bird diversity is habitat loss and fragmentation. Rapid urbanization, construction of roads, buildings, and expansion of agricultural activities have led to the destruction of natural habitats. Another significant threat is the intensive use of pesticides, insecticides, and chemical fertilizers in agricultural fields. Many bird species, especially insectivorous birds, depend on insects as their primary food source. Excessive use of agrochemicals decreases insect abundance and may also directly poison birds through contaminated food and water.

Wetland degradation is also a major concern in the region. Wetlands provide critical habitats for waterbirds, waders, and migratory species. Activities such as drainage, encroachment, pollution, and excessive extraction of water reduce the ecological value of wetlands. Accumulation of domestic waste, plastic materials, and agricultural runoff further deteriorates water quality, making wetlands unsuitable for many bird species.

Collectively, habitat destruction, agricultural intensification, wetland degradation, pollution, climate change, and human disturbances represent major threats to bird diversity in Bishnah. Addressing these challenges is essential for maintaining ecological balance and ensuring the long-term conservation of avian communities in the region.

Conservation Measures

The most important conservation measure is the protection and restoration of natural habitats. Agricultural lands, wetlands, ponds, grasslands, and tree-covered areas should be managed sustainably to provide suitable feeding, nesting, and roosting habitats for birds. Degraded habitats should be restored through plantation programs, wetland rehabilitation, and the preservation of native vegetation. Maintaining habitat connectivity is equally important, as it allows birds to move freely between feeding and breeding sites.

Wetland conservation should receive special attention because wetlands support numerous resident and migratory bird species. Measures such as preventing encroachment, controlling pollution, regulating water extraction, and maintaining natural hydrological conditions can significantly improve habitat quality. Community participation in wetland management can further enhance conservation efforts and ensure long-term sustainability.

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The promotion of environmentally friendly agricultural practices is another effective conservation strategy. Farmers should be encouraged to minimize the use of chemical pesticides, herbicides, and fertilizers. Integrated Pest Management (IPM), organic farming, and biological control methods can reduce harmful impacts on birds and other wildlife. Afforestation and tree plantation programs can contribute significantly to bird conservation. Raising public awareness and environmental education is crucial for successful bird conservation. Strict implementation of wildlife protection laws and regulations is necessary to prevent illegal hunting, trapping, and trade of birds. Long-term scientific monitoring and research are essential for understanding population trends, habitat requirements, and conservation needs of bird species. Finally, efforts should be made to address the impacts of climate change through habitat restoration, ecosystem management, and sustainable development practices. Conserving diverse habitats can enhance the resilience of bird populations to environmental changes and extreme climatic events.

CONCLUSION

The present study documented 50 avian species and provides baseline information on bird diversity in Bishnah and contributes to the understanding of habitat-related variations in avian communities. The findings demonstrate that rural habitats are more favorable for supporting diverse bird populations than urban habitats. The study also reinforces the importance of conserving natural and semi-natural habitats to maintain ecological balance and protect local biodiversity. Human activities such as urban expansion, construction activities, road development, removal of vegetation, and increasing pollution may negatively influence bird populations by reducing habitat quality and availability of nesting sites. Continued urbanization in the Bishnah region could lead to habitat fragmentation and decline of sensitive bird species if appropriate conservation measures are not adopted. Protection of wetlands, preservation of village trees, maintenance of agricultural landscapes, and development of urban green spaces are therefore essential for sustaining avian diversity in the region. Future studies involving long-term monitoring and seasonal assessments will provide a more comprehensive understanding of avian population dynamics in the Bishnah region.

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