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Avian Diversity in Walayar Lake, Palaghat District, Kerala, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Investigation of avian diversity and their natural ecosystem at the local and regional level is the first step to understand and classifying a specific region's ecological importance and, in this regard, the present work is undertaken. Walayar Lake is located at Westernghats having rich aquatic vegetation and harbors several kind animals including birds. The present study deals with the avifaunal diversity in and around the Walayar lake. A study on the avifauna diversity was conducted from January 2018 to December 2019. In this survey conducted for a period of 2 years, forty-three species of birds belong 14 different orders and 28 families were recorded. Of these 43 species, 19 were resident to this area. 9 were migrant species while 7 were winter migrant species, 6 local were migrant species and 2 were resistant migratory species. Regarding the occurrence, 28 species were common to the place, 7 species were uncommon, 3 were fairly common and 2 were found occasionally. Regarding feeding habits, 21 were insectivores, 13 species were carnivores, 6 were omnivores followed by 2 frugivores and 1 granivore. As per IUCN Status, 38 species are least concern (LC) and 5species near threatened (NT). There are so many conservation challenges such as anthropogenic alteration of the habitats in and around the lake is a major threat to the biodiversity of avifauna.

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1. INTRODUCTION

Birds are an important biotic component of an ecosystem and they play useful role in the controlling insect pests of agricultural crops, as predators of rodents, as scavengers and pollinating agents. But, this wildlife resource, like other resources, is being exploited at a greater pace of other natural resources. un common Birds are among the readily recognized categories of animals, due to the presence of feathers, which although ornithologists and bird watchers Mainly for flight and bipedal locomotion are characteristics of birds.

"India being a megadiversity Centre harbors 1,200 species of avi-fauna which contributes to 13 percent of the world avian species" [1,2]. "Wetlands are the most important ecosystems which is helpful for improving water quality" [3,4]. Many cities in India contain vast biodiversity of flora and fauna but due to rapid urbanization there has been an alarming reduction in biodiversity.

Most of the ornithological studies were based on the lowlands, while in high altitudes, investigations are rare and fragmentary [5] revealed "the importance of migrant and resident birds in the upper Moulouya". "Similarly, the importance of breeding populations in different habitat are mentioned in high altitudes of Beni Mellal" [6]. "On the other hand, these studies neglected the socioeconomic roles of this avian diversity, particularly in link with a diversity of natural ecosystems. Because the use of natural landscapes and their biological diversity in green activities such as ecotourism, geotourism, and other sustainable forms of tourism is suggested to increase the incomes of local populations and ensure the valorization of natural resources" [7-9].

"Many studies have demonstrated the importance of habitat heterogeneity in wetland bird richness and abundance" [10-12]. "Changes in landscape structure result in habitat loss and fragmentation which in turn affect biodiversity and ecosystem processes in urban areas" [13-16]. As highly increasing urbanized and industrialized practices, wetland ecosystems are exposes to natural and man-induced transformations through physical, chemical and vigorous processes. Anthropogenic pollution on water bodies is more severe increasingly. Since, there is no report on avifaunal diversity and status on the birds prevailing in Walayar Lake Palghat district of Kerala, to create the awareness for avifaunal conservation, preliminary observations were made and documented.

2. MATERIALS AND METHODS

2.1 Study Area

Walayar Lake is located in the Palghat district of Kerala, 25 km away from Coimbatore district Tamilnadu. (10°50′40″N 76°51′7″E). The water from Walayar river and Navakarani river coming from Parapatti is being stored in this dam and released to Nellicheri dam for irrigation and drinking purposes. This area was declared as Reserve Forest in Government of Kerala. Walayar dam is constructed across this river. It was completed and opened in 1964. The river has capacity a valley and a garden equipped with a children's play area. The dam holds a larger reservoir area, and the people living near by the reservoir utilizes the water as their main water source for irrigation. But currently the dam water holding capacity the reservoir is reduced due to lesser rain fall at Waylayer [17].

2.2 Survey and Identification

A study bird diversity in and around Walayar lake, Palakkad district in Kerala were surveyed during January 2018 to December 2019. Based on the survey findings, birds tend to be most active and mobile during periods of low to medium light frequency. Consequently, the field data collection was done during the morning hours (between 06.00 and 10.00 hrs) as well as in the evening hours (from 16.00 to 18.00 hrs). Data were gathered over a period of 24 months. For the data collection and field survey, a pair of binocular (Casan Professional 8 x 4 HD binocular 10 X Zoom folding Power Lens portable Binocular Telescope), Digital Single-Lens Reflex (700D, 1100D and Nikon D5800) cameras were used for photography and observed the birds accurately. Identification of birds species individually and also in groups were done. "Some birds were also recorded after being listened. Previous data and the background information were obtained through various articles in newspapers, journals, books, publications and government reviews. The scientific names, common names and IUCN status were ascertained as per Bird Life international and also statistical" [18,19].

Fig. 1. A map showing study area Walayar lake

2.3 Data Analysis

The recorded bird species have been classified on the basis of their IUCN categories, shared feeding guild affiliations and migration status.

$$\text{Percent occurrence} = \frac{\text{No. of individual species}}{\text{Total No. of species}} \times 100$$

3. RESULTS AND DISCUSSION

A study on the bird diversity in and around Walayar lake, Palaghat district in Kerala was carried out surveyed during January 2018 to December 2019. A total of 43 bird species belonging to 28 families of 14 orders were recorded (Table 1). The low diversity may be due to constant anthropogenic activities within and around the study area. The dominant families are Ardeidae, Scolopacidae, Charadriidae, Threskiornithidae, Phalacrocoracidae, Charadriidae, Accipitridae, Anatida, Corvidae, Scolopacidae followed by the families Pycnonotidae, Emberizidae, Rallidae, Phasianidae, Psittaculidae, Sturnidae, Podicipedidae, Pelecanidae, Ploceidae, Passeridae, Muscicapidae, Dicruridae, Haematopodidae, Rostratulidae, Upupidae, Ciconiidae, Alaudidae, Motacillidae showed (Fig. 2). The abundance status of the birds are Common (C) 28 species, Uncommon (UC) 7 species, fairly common (FC) 3 species, Followed by Occasional (O) 2 species, Very common (VC), abundance(A) and scavenge(S) are each one species showed (Fig. 3). Resident of dietary status most of the then are Stute's insectivores (21) species followed by Carnivorous (13) species, Omnivores (6) species, Frugivores (2) species, Granivores a single species belong to (Fig. 4). Regarding residential status ,19 species and 9 are migrant species.7 are winder migrated species, 6 species are local migrated (Fig. 5). As the IUCN status 5 species are near threatened they are (*Pelecanus philippensis), Eurasian oystercatcher (Haematopus ostralegus), Greater Painted-Snipe (Rostratula benghalensis), Black-necked Stork (Ephippiorhynchus asiaticus), Asian Dowitcher (Limnodromus semipalmatus*).

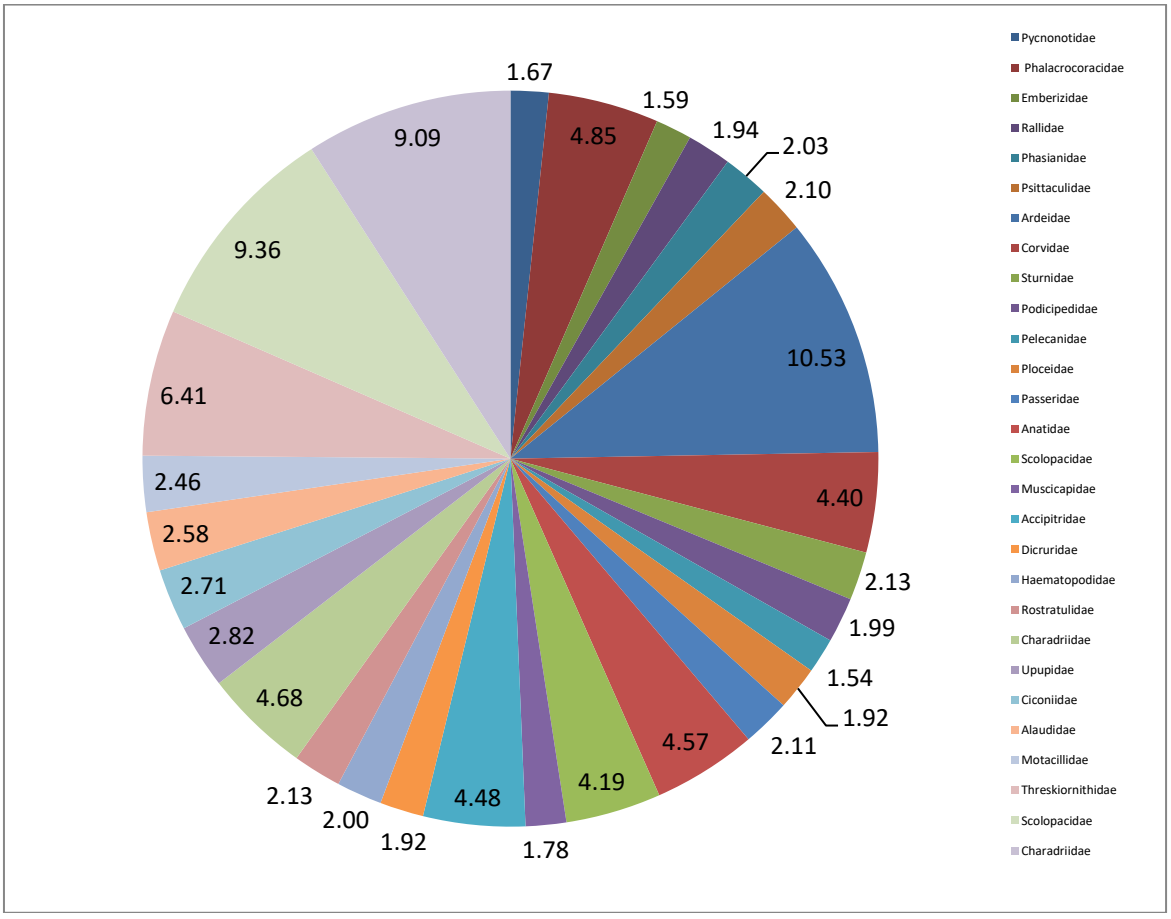

Fig. 2. Percentage occurrence of birds represented by families

Table 1. Checklist of avifauna of Walayar lake, Palaghat district, Kerala

S. No.	Birds name	Scientific name	Family	Residential status	Abundance	Feeding guilds
1	White eared bulbul	*Pycnonotus leucotis* (Gould, 1836)	Pycnonotidae	M	C	IN
2	Little cormorant	*Microcarbo niger* (Vieillot, 1817)	Phalacrocoracidae	R	C	CR
3	Great Cormorant	*Phalacrocorax carbo* (Linnaeus, 1758)	Phalacrocoracidae	LM	C	CR
4	Crested bunting male	*Emberiza lathami* (Gray, 1831)	Emberizidae	WM	C	IN
5	Common coot	*Fulica atra* (Linnaeus, 1758)	Rallidae	WM	C	O
6	Indian peafowl	*Pavo cristatus* (Linnaeus, 1758)	Phasianidae	R	UC	O
7	Rose-ringed parakeet	*Psittacula krameri* (Scopoli, 1769)	Psittaculidae	R	C	CR
8	Little egret	*Egretta garzetta* (Linnaeus, 1766)	Ardeidae	R	UC	CR
9	Large egret or great egret	*Ardea alba* (Linnaeus, 1758)	Ardeidae	R	UC	CR
10	Median Egret or intermediate egret	*Ardea intermedia* (Wagler, 1827)	Ardeidae	R	C	CR
11	Purple Heron	*Ardea purpurea* (Linnaeus, 1766)	Ardeidae	LM	C	CR
12	Indian Jungle crow	*Corvus culminatus* (Sykes, 1832)	Corvidae	R	C	O
13	House crow	*Corvus splendens* (Vieillot, 1817)	Corvidae	R	FC	CR
14	Common myna	*Acridotheres tristis* (Linnaeus, 1766)	Sturnidae	R	C	O
15	Little grabe	*Techybaptus ruficollis* (Pallas, 1764)	Podicipedidae	R	FC	IN
16	Spot billed pelicon	*Pelecanus philippensis* (Gmelin, 1789)	Pelecanidae	RM	C	FR
17	Baya Weaver	*Ploceus philippinus* (Linnaeus, 1766)	Ploceidae	R	C	GR
18	House sparrow	*Passer domesticus* (Linnaeus, 1758)	Passeridae	R	C	IN
19	Indian -Spot billed duck	*Anas poecilorhyncha* (Forster, 1781)	Anatidae	RM	C	O
20	Cotton Teal	*Nettapus coromandelianus* (Gmelin, 1789)	Anatidae	R	A	O
21	Ruddy turnstone	*Arenaria interprets* (Linnaeus, 1758)	Scolopacidae	M	VC	IN
22	Common Snipe	*Gallinago gallinago* (Linnaeus, 1758)	Scolopacidae	WM	S	CR
23	Oriental magpie-robin	*Copsychus saularis* (Wagler, 1827)	Muscicapidae	R	C	CR
24	White-bellied Sea -Eagle	*Haliaeetus leucogaster* (Gmelin,1788)	Accipitridae	R	C	FR
25	Booted Eagle	*Hieraetus Pennatus* (Gmelin, 1788)	Accipitridae	M	C	CR
26	Black Drongo	*Dicrurus macrocercus* (Vieillot, 1817)	Dicruridae	R	C	IN
27	Eurasian Oystercatcher	*Haematopus ostralegus* (Linnaeus, 1758)	Haematopodidae	M	UC	CR
28	Greater Painted-Snipe	*Rostratula benghalensis* (Linnaeus, 1758)	Rostratulidae	LM	C	IN
29	Greater Sand Plover	*Charadrius leschenaultii* (Lesson, 1826)	Charadriidae	WM	C	IN
30	Kentish Plover	*Charadrius Aalexandrinus* (Linnaeus, 1758)	Charadriidae	M	C	IN

S. No.	Birds name	Scientific name	Family	Residential status	Abundance	Feeding guilds
31	Common Hoopoe	*Upupa epops* (Linnaeus, 1758)	Upupidae	R	UC	IN
32	Black-necked Stork	*Ephippiorhynchus asiaticus* (Latham, 1790)	Ciconiidae	R	C	CR
33	Eurasian skylark	*Alauda gulgula* (Linnaeus, 1758)	Alaudidae	LM	C	IN
34	Forest wagtail	*Dendronanthus indicus* (Gmelin, 1789)	Motacillidae	M	C	IN
35	Australian white ibis	*Threskiornis molucca* (Cuvier, 1829)	Threskiornithidae	M	O	IN
36	African sacred ibis	*Threskiornis aethiopicus* (Latham, 1790)	Threskiornithidae	M	O	IN
37	White Ibis	*Threskiornis melanocephlus (Latham, 1790)*	Threskiornithidae	LM	C	IN
38	Temminck's Stint	*Calidris temminckii* (Leisler, 1812)	Scolopacidae	WM	C	IN
39	Asian Dowitcher	*Limnodromus semipalmatus* (Blyth, 1848)	Scolopacidae	M	FC	IN
40	Common Redshank	*Tringa totanus* (Linnaeus, 1758)	Scolopacidae	WM	UC	IN
41	Red-wattled Lapwing	*Vanellus indicus* (Boddaert, 1783)	Charadriidae	LM	UC	IN
42	Yellow-wattled Labwing	*vanellus malabaricus* (Boddaert, 1783)	Charadriidae	WM	C	IN
43	white-tailed lapwing	*Vanellus leucurus* (Lichtenstein, 1823)	Charadriidae	R	C	IN

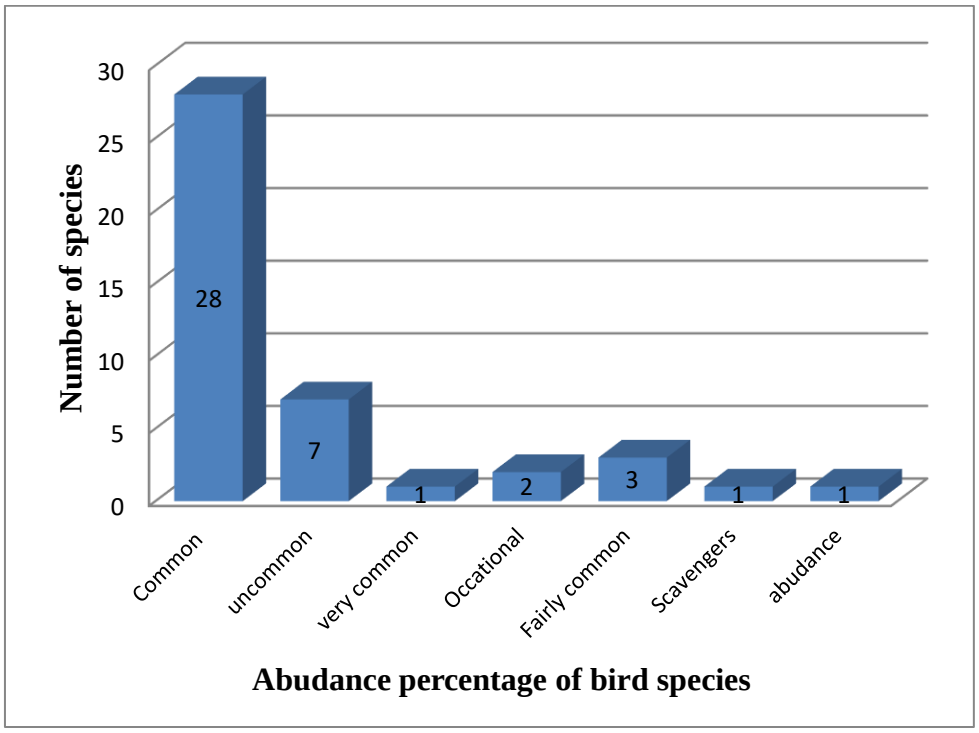

Fig. 3. Family wise abundance % of Bird species

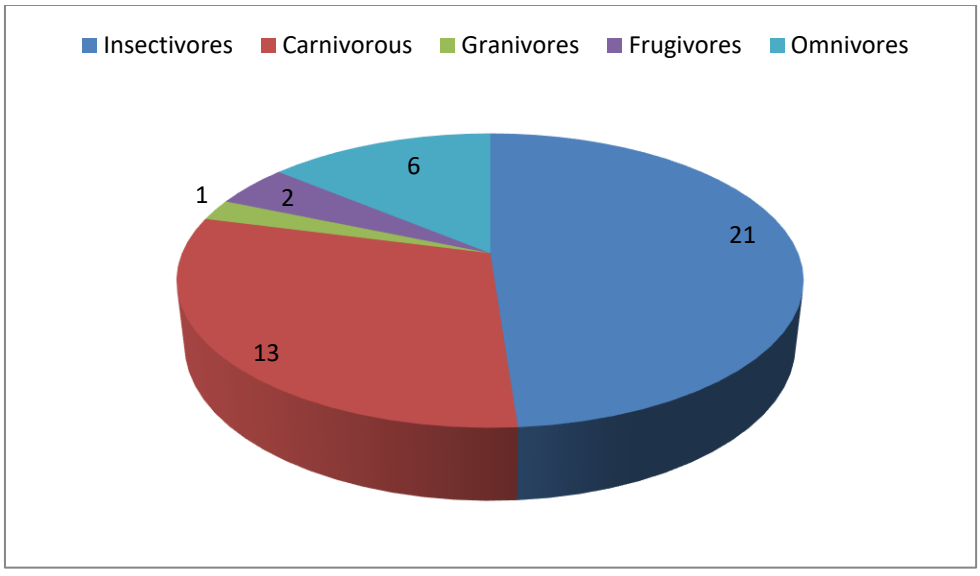

Fig. 4. Dietary pattern of avifaunal population

Studies are available on the diversity of bird in aquatic ecological system and [20] recorded Ardeidae to be the most dominant family in Bharathpuzha river basin in Kerala. [21] have recorded 50 species of water birds in Mangalajodi Wetland. [22] observed a total 151 species at Chandoli National Park in Western Ghats, (now declared as international heritage site) Maharashtra state. [23] A total of 47 wetland bird species were recorded at Bathi Lake, Doddabathi Village, Davanagere District, Karnataka [24]. Observed 94 species of Birds in kottuli wetland. Seventy-one bird species were reported from Bhimasandra Pond, Tumakuru, Karnataka State by [25,26] reported 30 water birds from Ahiran lake, Murshidabad, west

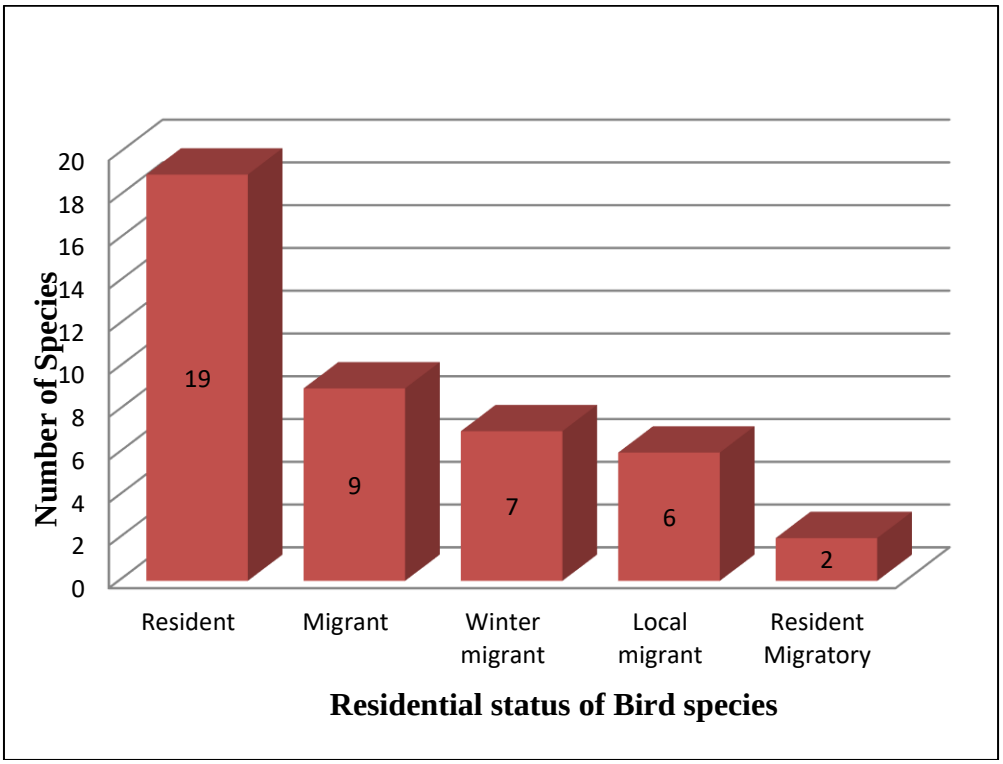

Fig. 5. Residential status of Bird species

Bengal [27] reported 41 species of birds In Ousudu lake, Puducherry. In Tamilnadu [28] recorded 117 bird species from Thiruthalaiyur Lake, Tiruchirapalli Forest Division, A total 86 water bird species were recorded at Khairbandha Lake in Gondia district, Maharashtra State by [29,30] reported 51 wetland bird species in Komaranahalli Lake, Davanagere District, Karnataka. In Kerala [31] observed 92 bird species at Meenachil river basin.

"In addition to the diversity of avian species, the Eastern and Central High Atlas host a significant diversity of ecosystems and natural sites. Rivers, dams, and lakes as aquatic ecosystems and forests and tops of Mountains as terrestrial ones were reported. Similar results were mentioned in both parts of the High Atlas" [32,8,6]. "The diversity of natural and human-made ecosystems is suggested to support the avian richness with forage and breeding resources" [33].

"The Wetland birds are in general being heterogeneous in their feeding habits. In the present study, the habitat support to different aquatic fauna like fishes, crustaceans, invertebrates, water plants and planktons as the primary feed and also irrigated agricultural fields surrounding the lake probably provided foraging grounds for the resident as well as few migratory birds,. Walayar lake is rich in avifauna but environmental problems have arisen recently Leads to loss which referents in avi diversity, due to unplanned activities being carried out in favour of human development, for which the larger trees of the area have been cleared. Birds are sensitive to the local landscape and change in vegetation patterns can affect the population of birds as observation in other areas" [11,10].

4. CONCLUSION

From this study, the result shows that the wetland area, agriculture land and surrounding vegetation provides are favorable environment for the migratory, resident as well as the threatened species of birds. But apart from this, the interference of human activities i.e. agriculture, deforestation etc is also increasing day by day. Though, the anthropogenic activities such as use of chemicals in agriculture land, and logging have an effect on the bio-diversity of birds at this region in future. Viewing this in mind steps should be taken to do proper maintenance and conservation of the lake and nearby area.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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