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Pingali Lake, District Satara, Maharashtra, A Neglected Potential Habitat for Avifauna

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Abstract

Pingali Lake is located in Dahiwadi Tehsil, one of the drought prone Tehsil of Satara District. The water of this Lake is non Perennial and used for Agricultural and Household purpose of Dahiwadi city located near the Lake. Pingali Lake is neighboring to Andhali, Mayani and Yeralwadi water reservoirs. Although Pingali Lake is smaller than the above mentioned water reservoirs, it acts as an excellent neighboring water body for birds. During the visits, a diverse variety of migrating birds were observed in Pingali Lake and surrounding vegetation. For the study of migratory and resident birds the survey was conducted from June 2022 to February 2024. The checklist of birds was prepared found occurrence of total 67 species belonging to 34 families. Out of 67, 10 species of birds were migrant, 26 were resident migrant and 31 species were resident of Pingali lake. According to IUCN Red data list we observed 64 species with least Concerned status, 02 species Near Threatened and 01 Vulnerable species.

Keywords: Avifauna, Pingali lake, Dahiwadi, Anthropogenic Impact.

Introduction

Birds are warm blooded, egg laying vertebrates belonging to class Aves. They are the important component of ecosystem and are ecologically versatile. They play very important role as potential pollinators, scavengers and healthy ecosystem indicator (Ali, 2012). There are more than 9000 living bird species found worldwide. The Indian subcontinent is broad tropical, sub-tropical and arid vegetation zone and having one of the rich biodiversity. Indian subcontinent contributes about 1375 species which makes up around 14% of total living bird population (Grimmett *et al.*, 2011).

Pingali lake is one of the non-perennial water body located at boundary of Dahiwadi and Khatav Tehsils. Both Khatav and Dahiwadi Tehsil receives least annual rainfall and are one of the most drought prone regions of Satara District (Dhulgude *et al.*, 2023). On the North side of lake, Dahiwadi city is located. The lake backwater is present on the west side of lake. The Satara-Pandharpur highway went from Southern side of lake. The water from Pingali dam is used for agricultural purpose and also for household purpose of Dahiwadi city. As well as it is a fishing sight for local fisherman. Fishing activity peaks during monsoon and post monsoon season. There are four inlets to the Pingali lake from where water is gathered. The adjoining area of dam is surrounded by many shrubs to some of trees. Some grassland area is also present at backwater of lake. The cultivations are primarily present near the northern side of lake where Dahiwadi city is located.

The nearby wetland water bodies from the Pingali dam are Andhali water reservoir, Yeralwadi water reservoir and Mayani water reservoir. The first water body is located north to Pingali lake is Andhali water reservoir. It is present about 8km north to Pingali lake. The second one is Yeralwadi water reservoir present around 20km South to Pingali dam. Mayani water reservoir is present around 30km South east to Pingali Dam. The Bird Conservation Reserve is present in Mayani under Vaduj forest Range of Satara (Govt. of Maharashtra). All these water reservoirs are of large water capacity than the Pingali lake. Even though, the Pingali lake acts as neighboring water body for birds. The birds from Mayani, Yeralwadi and Andhali visits the Pingali lake for some hours to some days in every season. Along with bird visits, many other species of birds build their nests around the Pingali lake area.

The current Survey was carried out seasonally from June 2022 to February 2024 and reported about 67 species of resident and migratory birds from Pingali lake. Abundance of these species with IUCN status is given in the observations (Table 1).

Material and Methods

a) Study Area

Pingali Dam is located near boundary of Khatav and Dahiwadi Tehsil near Satara-Pandharpur Highway. It is situated in Latitude 17°41'11"N and 74°32'1"E Longitude.

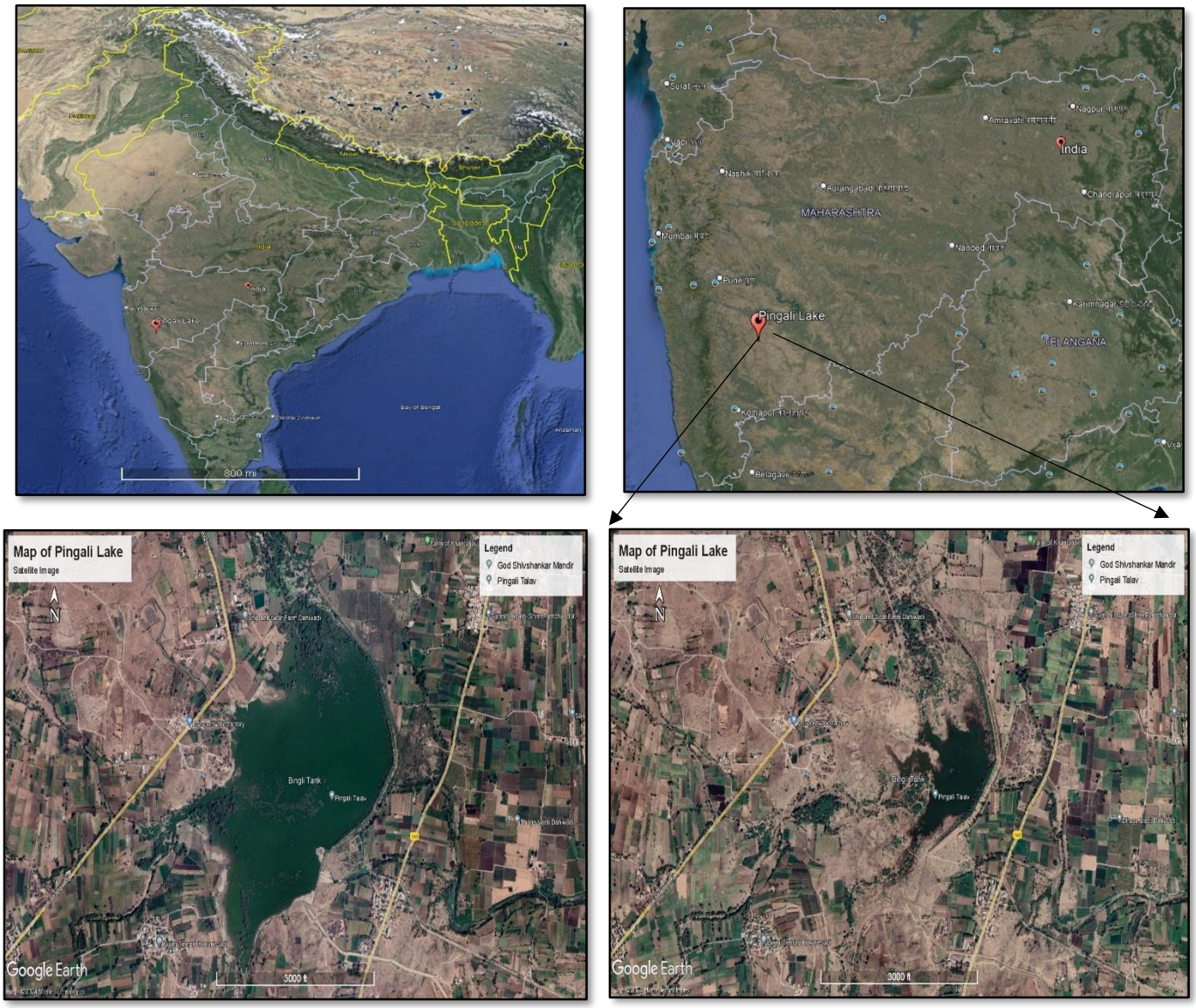

Fig. A) Satellite image of **1.** India, **2.** Maharashtra,
3. Pingali lake Post Monsoon Season, **4.** Pingali lake Late Summer Season

b) Bird Sampling

Observations of the birds from Pingali la ke was started from June 2022 to February 2024. The seasonal survey with weekly visit for one m onth per season for two consecutive years was conducted and observations were recorded. Observation of birds was done by Haus-Alchemy 20*50 wide angle Binocular and wherever possible photographed by Sony alpha-7 DSLR camera. The photographic identification of birds was done as per Grimmett *et al.*, 2011; Salim Ali, 2002 (Revised by J. C. Daniel) etc.

c) Data Analysis

Checklist of birds was compiled based on observations during visits (Table 1). All sighted birds were ranked according to following abundance categories (Deshmukh and Rudey, 2019):

\+ = rare (1 - 3 sightings),
++ = common (4 – 10 sightings),
+++ = abundant (11 - 30 sightings) and

++++ = very abundant (> 30 sightings)

The birds were also categorized into their migratory status based on bird observation guide Ali & Ripley (2001), Grimmett et. al., (2011) and field observations.

Observations

Abbreviations: R – Resident; RM – Resident Migrant; M – Migrant; AS – All Season; LC – Least concerned; MN – Monsoon; WT – Winter; NT – Near Threatened; VU – Vulnerable; + - Rare (1-3 sightings); ++ - Common (4-10 Sightings); +++ - Abundant (11-30 Sightings); ++++ - Very Abundant (> 30 Sightings)

Sr. No.	Scientific Name	Common Name	Status	Season	IUCN	Abundance
	Family – Accipitridae					
1	*Elanus caeruleus*	Black-shouldered Kite	R	AS	LC	++
2	*Milvus migrans*	Black Kite	R	AS	LC	+++
3	*Haliastur indus*	Brahminy Kite	RM	AS	LC	+
	Family – Aegithinidae					
4	*Aegithina tiphia*	Common Iora	R	AS	LC	++
	Family – Alcedinidae					
5	*Halcyon smyrnensis*	White-throated Kingfisher	RM	AS	LC	+
6	*Alcedo atthis*	Common Kingfisher	R	AS	LC	+
7	*Ceryle rudis*	Pied Kingfisher	R	AS	LC	++
	Family - Anatidae					
8	*Anser indicus*	Bar Headed Goose	M	WT	LC	+++
9	*Tadorna ferruginea*	Ruddy Shelduck	M	WT	LC	++
10	*Anas poecilorhyncha*	Indian Spot-billed Duck	RM	AS	LC	++++
11	*Anas clypeata*	Northern Shoveler	M	WT	LC	+
12	*Anas strepera*	Gadwall	M	WT	LC	+
	Family – Apodidae					
13	*Cypsiurus balasiensis*	Asian Palm Swift	R	AS	LC	++++
	Family – Ardeidae					
14	*Butorides striata*	Striated Heron	RM	MN	LC	+
15	*Ardeola grayii*	Indian Pond Heron	RM	AS	LC	++
16	*Ardea cinerea*	Grey Heron	RM	MN,WT	LC	+++
17	*Bubulcus ibis*	Cattle Egret	R	AS	LC	++++

18	*Casmerodius albus*	Great White Egret	RM	MN, WT	LC	++
19	*Egretta garzetta*	Little Egret	RM	AS	LC	++
20	*Mesophoyx intermedia*	Intermediate Egret	RM	WT	LC	+
	Family – Bucerotidae					
21	*Ocyceros birostris*	Indian Grey Hornbill	RM	AS	LC	++
	Family – Campephagidae					
22	*Pericrocotus cinnamomeus*	Small Minivet	R	AS	LC	+
	Family – Charadriidae					
23	*Vanellus malabaricus*	Yellow-wattled Lapwing	R	AS	LC	+
24	*Vanellus indicus*	Red-wattled Lapwing	R	AS	LC	+++
25	*Charadrius dubius*	Little Ringed Plover	RM	WT	LC	+
	Family – Ciconiidae					
26	*Mycteria leucocephala*	Painted Stork	R	AS	LC	++++
27	*Anastomus oscitans*	Asian Openbill	RM	MN, WT	LC	+++
28	*Ciconia episcopus*	Woolly-necked Stork	RM	MN, WT	NT	++
	Family - Columbidae					
29	*Columba livia*	Common Pigeon	R	AS	LC	+++
30	*Streptopelia decaocto*	Eurasian Collared Dove	R	AS	LC	++
	Family – Corvidae					
31	*Dendrocitta vagabunda*	Rufous Treepie	R	AS	LC	+
32	*Corvus splendens*	House Crow	R	AS	LC	+++
	Family – Cuculidae					
33	*Eudynamys scolopaceus*	Asian Koel	R	AS	LC	++
34	*Centropus (Sinensis) parroti*	Southern Coucal	RM	AS	LC	+

	Family - Dicruridae					
35	*Dicrurus macrocercus*	Black Drongo	R	AS	LC	+++
	Family – Estrildidae					
36	*Lonchura punctulata*	Scaly-breasted Munia	R	AS	LC	++
	Family – Glareolidae					
37	*Glareola lactea*	Small Pratincole	RM	AS	LC	++
	Family – Laridae					
38	*Sterna aurantia*	River Tern	RM	AS	VU	+++
39	*Chroicocephalus ridibundus*	Gull	M	WT	LC	+
	Family – Meropidae					
40	*Merops orientalis*	Green Bee-eater	R	AS	LC	++
	Family – Motacillidae					
41	*Motacilla maderaspatensis*	White-browed Wagtail	RM	AS	LC	+
	Family – Muscicapidae					
42	*Copsychus saularis*	Oriental Magpie Robin	R	AS	LC	++
43	*Saxicoloides fulicatus*	Indian Robin	RM	AS	LC	+++
	Family – Nectariniidae					
44	*Cinnyris asiaticus*	Purple Sunbird	R	AS	LC	++
	Family - Passeridae					
45	*Passer domesticus*	House Sparrow	R	AS	LC	++++
	Family – Phalacrocoracidae					
46	*Phalacrocorax niger*	Little cormorant	RM	AS	LC	+
47	*Phalacrocorax fuscicollis*	Indian Cormorant	RM	AS	LC	++
48	*Phalacrocorax carbo*	Great Cormorant	RM	MN, WT	LC	+
	Family – Phasianidae					

49	*Pavo cristatus*	Indian Peafowl	R	AS	LC	++
	Family – Ploceidae					
50	*Ploceus philippinus*	Baya Weaver	R	AS	LC	++
	Family – Pycnonotidae					
51	*Pycnonotus jocosus*	Red-whiskered Bulbul	R	AS	LC	++
52	*Pycnonotus cafer*	Red-vented Bulbul	R	AS	LC	+++
	Family - Rallidae					
53	*Porphyrio porphyrio*	Purple Swamphen	RM	AS	LC	++
54	*Fulica atra*	Common Coot	M	WT	LC	++
55	*Gallinula chloropus*	Common Moorhen	RM	WT	LC	+
	Family – Recurvirostridae					
56	*Himantopus himantopus*	Black Winged Stilt	M	WT	LC	+++
	Family - Scolopacidae					
57	*Tringa glareola*	Wood Sandpiper	M	WT	LC	++
	Family - Sturnidae					
58	*Acridotheres ginginianus*	Bank Myna	R	MN	LC	+
59	*Acridotheres tristis*	Common Myna	R	AS	LC	+++
60	*Sturnia pagodarum*	Brahminy Starling	R	AS	LC	+++
	Family – Threskiornithidae					
61	*Threskiornis melanocephalus*	Black-headed Ibis	M	WT	NT	++
62	*Pseudibis papillosa*	Red-napped Ibis	RM	MN, WT	LC	+
63	*Plegadis falcinellus*	Glossy Ibis	M	WT	LC	+
64	*Platalea leucorodia*	Eurasian Spoonbill	RM	MN, WT	LC	++++
	Family – Timaliidae					
65	*Dumetia hyperythra*	Tawny-bellied Babbler	RM	AS	LC	++

	Family – Upupidae					
66	*Upupa epops*	Common Hoopoe	R	AS	LC	++
	Family – Zosteropidae					
67	*Zosterops palpebrosus*	Indian White Eye	R	AS	LC	++

Table 1: List of Birds of Pingali Lake and around

Pingali is one of the group of water bodies from Khatav and Dahiwadi Tehsil. The other water bodies are Andhali water reservoir, Yeralwadi water reservoir and Mayani water reservoir as mentioned in figure (B). All are lying within the circumference 35km. All these neighboring water bodies along with Pingali lake are habitat for birds. The birds may migrate from one habitat to another habitat as population of birds such as *Platalea leucorodia* (Eurasian Spoonbill), *Threskiornis melanocephalus* (Black-headed Ibis), *Pseudibis papillosa* (Red-napped Ibis), *Tadorna ferruginea* (Ruddy Shelduck), *Anastomus oscitans* (Asian Openbill), *Mycteria leucocephala* (Painted Stork) etc. is observed to change every visit.

Due to drying up during post winter and summer season, it leads to exposure of land into small island of landmasses. At this places a type of flocking behavior is observed. A flock may contain more than 30 members of 6-8 species together. These small islands in lake also serves as hiding place for birds.

Apart from this, the bird *Threskiornis melanocephalus* (Black-headed Ibis) declared Near Threatened (NT) by IUCN Red Data List found to nesting around Pingali lake. The nests primarily found on the Coconut trees and the Communication Towers. The *Mycteria leucocephala* (Painted Storks) is found to build the nests in the arid zone of Pingali lake backwater. Since the *Sterna aurentia* (River Tern) [declared Vulnerable by IUCN Red Data List] was always observed in pairs, it is possible that they breed in and around the Pingali lake region. The other residential birds were also observed building their nests.

During the visits, it is observed that various recent anthropogenic activities influencing the water quality and bird diversity of Pingali lake. Throwing impaired fishing crafts in and around water reservoir cause heavy damage to birds as they clog in that crafts results in the death of that bird. Various plastic articles were also observed during the visit. Other anthropogenic activities observed are cattle washing, vehicle washing, streaming of the Brick kiln waste into lake water etc.

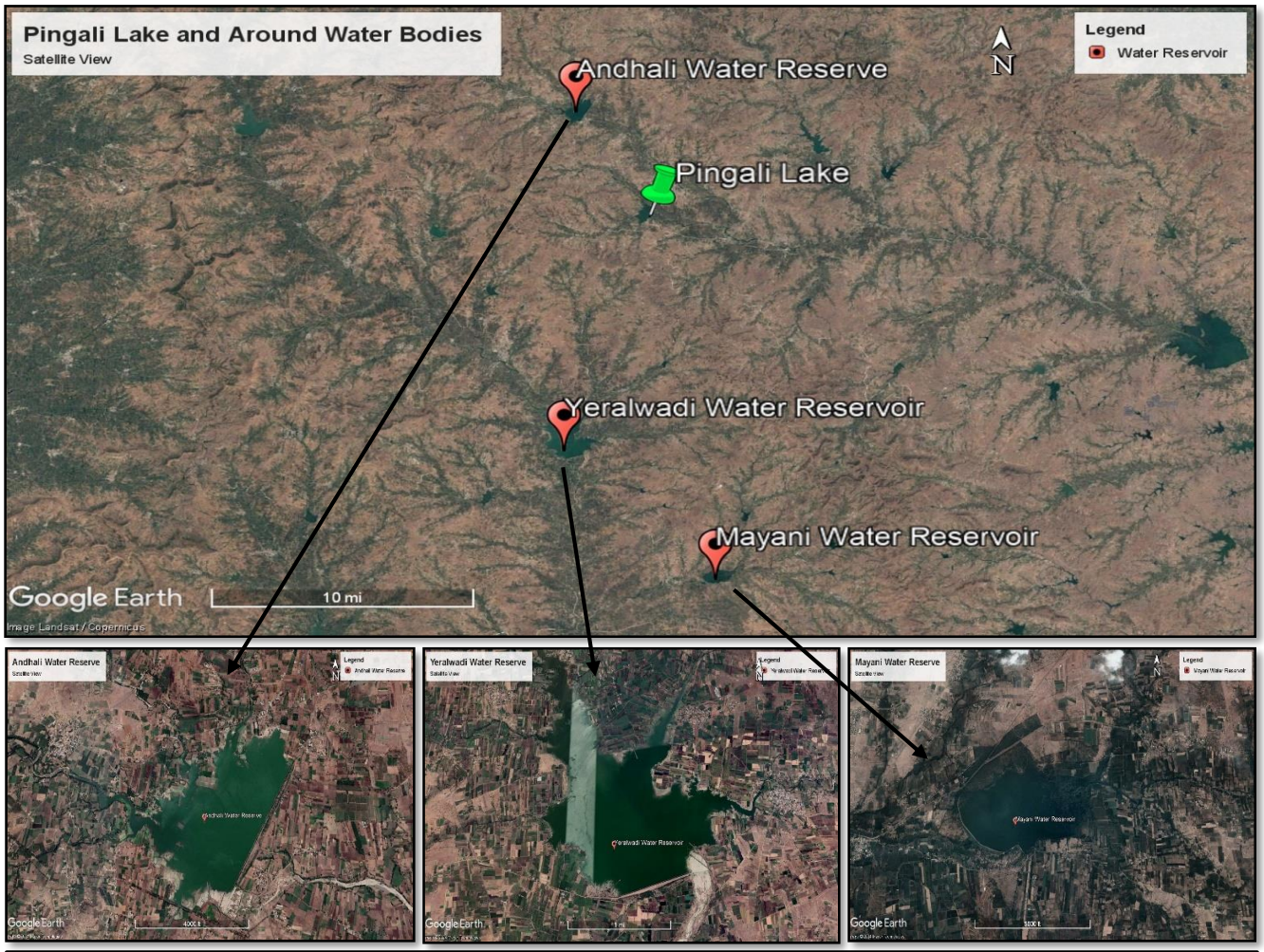

Fig. B) 1. Map showing Pingali Water Reservoir and Around Water Bodies; 2. Andhali Water Reserve; 3. Yeralwadi Water Reserve; 4. Mayani Water Reserve.

Result

In the present investigation about 67 species of both aquatic and terrestrial birds belonging to 34 different families were reported from Pingali lake and its peripheral ecosystems of Dahiwadi Tehsil. Out of total 67 species, 31 species were resident in the lake area, 26 were resident migrant and 10 species were found to be migrant which are actually occur during monsoon and winter season.

64 species according to IUCN are Least Concerned species, two of them (*Threskiornis melanocephalus* – Black headed ibis and *Ciconia episcopus* – Woolly necked stork) are Near Threatened (NT) species and one species (*Sterna aurentia* – River Tern) is Vulnerable (VU).

Around 20 species sighted rarely (1-3 sightings) during visits. Commonly found species count is 27 and 14 species were abundantly seen on filed. Less number i.e. 6 species occur very abundantly (> 30 sightings) during the visits. The graph shows below the abundance of bird species from Pingali lake.

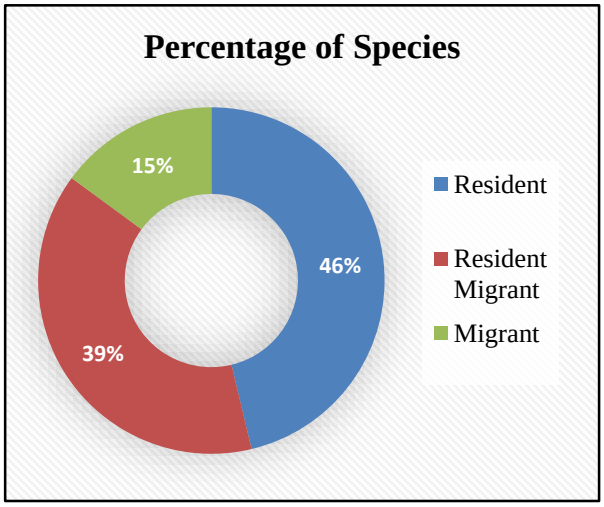

Fig. C) Percentage of Resident, Resident Migrant and Migratory Birds

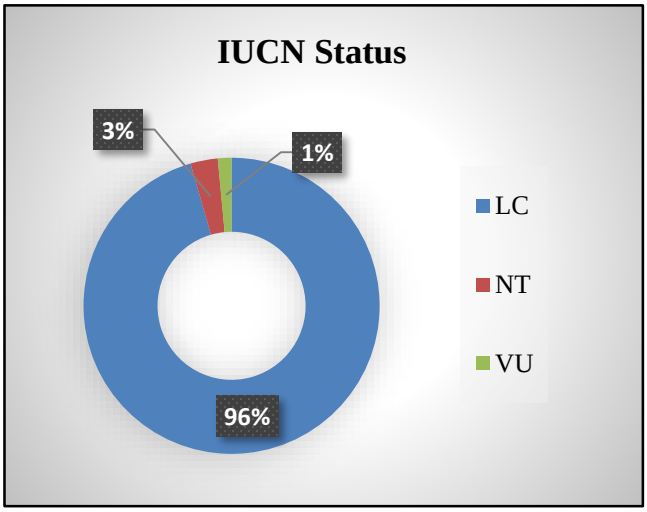

Fig. D) Percentage of birds according to the IUCN Red Data List

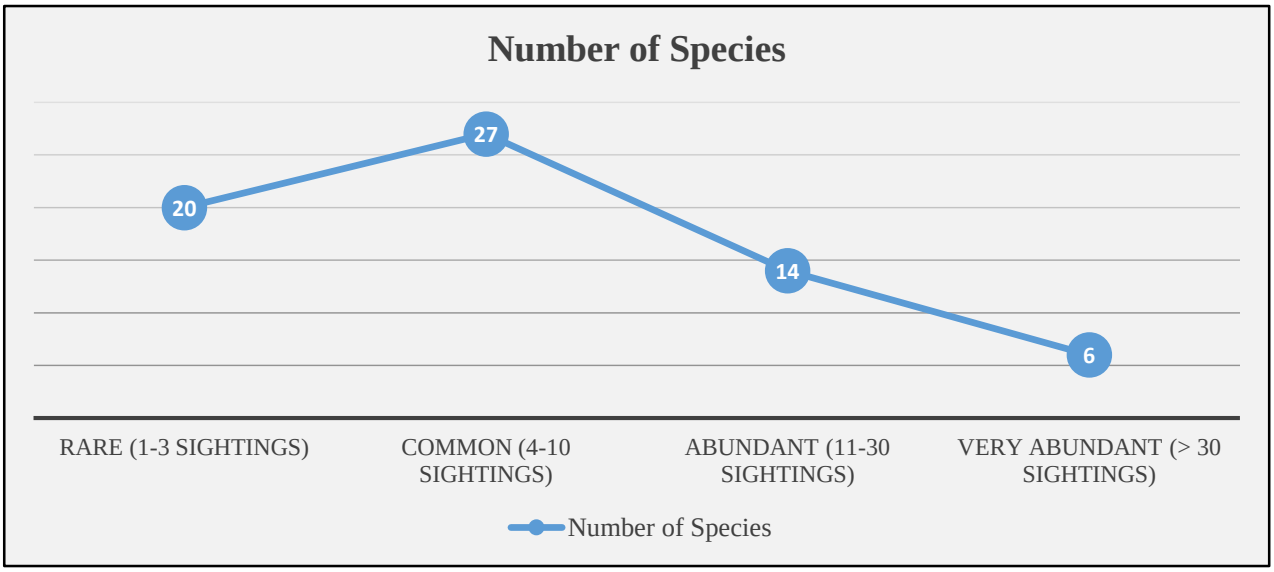

Fig. E) Graph showing Abundance of Avifauna of Pingali Lake

Discussion

The Pingali lake is neighboring water body to all other water bodies and can acts as alternate habitat for birds especially for migratory birds. The observation of change in number of bird species during the visits might indicate that they change the habitat for escaping, feeding and resting to Mayani, Yeralwadi and Andhali reservoirs for two to three days or sometimes for a week. During visits it was also observed that shouting, disturbance created by humans, throwing of stones, noise of vehicles, grazing cattle cause to migrate the flock of birds from one reservoir to another.

As the *Sterna aurentia* (River Tern) found to breed in Pune and Kolhapur District and the breeding occur in exposed floor of reservoir during the breeding season (Summer) (Narwade & Fartade, 2013). Considering the number present throughout the year, breeding might be completed in either of these three water bodies and this need to investigate further.

Mahabal *et al*., (2011) reported about 556 species of birds under 86 families from Maharashtra State. A total of 63 species belonging to 30 different families were reported from Tasgaon Tehsil, Sangli District by Khabade *et al*. (2022). Karkar (2021) studied the avifauna of Mayani Dam and reported the habitat loss in Mayani cause the birds to shift their habitat to Yeralwadi and Rajewadi water reservoirs. The present investigation presents the strong evidence of habitat dispersion from Mayani bird sanctuary to nearby water bodies like Yeralwadi, Pingali and Andhali water reservoirs.

Conclusion

Pingali lake can serve as a neighboring water body for migrating birds, although having a smaller water volume than Yeralwadi and Mayani Water Reserves it can serve as alternate and undisturbed habitat for the birds. The majority of Pingali lake's water is shallow, providing birds with better conditions for feeding and breeding. As the Pingali lake is surrounded by arid plants zone, this aids the birds to build their nests in the secure locations.

Recent anthropogenic activities negatively impact the avifauna of Pingali lake. Throwing away plastic waste, fishing gears and waste water making Pingali lake a dangerous place for birds. As the water body is home for around 70 species of birds including migratory birds. The conservation efforts must have made to make sure the protection of bird habitat.

Thus, if proper care and efforts are taken to limit anthropogenic activities, this water body can serve as an excellent habitat for birds especially aquatic avifauna

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Eurasian Spoonbill

Black Headed Ibis (M)

Red-napped Ibis

Painted Stork

Woolly-necked Stork (M)

Asian Openbill

Birds of Pingali Dam (Post Monsoon Season)

River Tern (Vulnerable)

Common Moorhen

Ruddy Shelduck

Indian Spot-billed Duck

Northern Shoveler

Bar Headed Goose

Common Kingfisher

Pied Kingfisher