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Present Status And Diversity Of Avifauna In Some Selected Sites Of Central Gujarat, India

Estado actual y diversidad de la avifauna en algunos sitios seleccionados del centro de Gujarat, India

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ABSTRACT

Birds play a very important role in maintaining the ecosystem's food chain and food web. A survey was carried out between October 2021 and February 2022 by Visual Survey method, which revels about 69 species of birds from 38 families, with a maximum of Ardeidae recorded during the study period. Among all the sites, maximum species were recorded from HGT S3 with 66, followed by DGT S2 with 54, VMR S4 with 30, and most minor with 25 at PGT S1. No man-made intervention should be allowed, and local authorities should be involved in protecting biodiversity richness.

Keywords: - Biodiversity; Birds; wetlands; Ponds; Rivers

RESUMEN

Las aves juegan un papel muy importante en el mantenimiento de la cadena alimentaria y la red alimentaria del ecosistema. Se realizó un censo entre octubre de 2021 y febrero de 2022 por el método de Encuesta visual, el cual revela alrededor de 69 especies de aves de (38) familias, con un máximo de Ardeidae registradas durante el período de estudio. Entre todos los sitios, el máximo de especies se registró desde HGT S3 con 66, seguido de DGT S2 con 54, VMR S4 con 30 y la mayoría menor con 25 en PGT S1. No debe permitirse ninguna intervención humana y las autoridades locales deben participar en la protección de la riqueza de la biodiversidad.

Palabras llave: - Biodiversidad; Aves; humedales; estanques; ríos

INTRODUCTION

Birds play a significant role in seed dispersals, seed predation, pollination, and scavenging. Bird population declines are a warning that the environment is being threatened, and bird population indicates whether or not we are disrupting the ecosystem. As a result, to maintain the ecosystem's equilibrium, we need to monitor the bird population (Vala et al., 2020). As per the eBird checklist, a total of 10,625 species have been spotted globally Fink et al., (2020). In India, 1369 birds have been identified according to birds of the Indian subcontinent (Grimmett et al., 2016). In Gujarat, around 526 species of birds have been identified (Vala et al., 2020).

Birds migrate for one of four reasons: food, shelter, nesting, or avoiding harsh weather. Birds are sensitive to environmental changes and are known as a "bio-indicator" as birds react quickly to environmental fluctuations because of their high mobility (Debnath et al., 2018). Many bird species rely on complex vegetation, such as herbs, shrubs, and trees and climbers, common in the wetland and riparian zone, for nesting and foraging (Rathod et al., 2017).

In recent years, the global diversity of birds has been diminishing due to some harsh climate conditions and different anthropogenic activities (Debnath et al., 2018). India has done several research on local and migratory waterbird populations and the effects of bird aggregation on the physicochemical conditions of lake, ponds, and rivers (Vankar et al., 2018). The present study was undertaken to know the avifaunal diversity of four sites, PGT (S1), DGT (S2), HGT (S3), and VMR (S4), from October 2021 to February 2022.

MATERIALS AND METHODOLOGY

Gujarat is located on the west coast of the Indian peninsula, having vast plains, rivers, ponds, hilly regions, and the gulf. Four sites Petli Gam Talav (PGT S1) (22.598647°, 72.757152°), Deva Gam Talav (DGT S2) (22.620332°, 72.734993°), Heranj Gam Talav (HGT S3) (22.660040°, 72.696840°), Vishvamitri River (VMR S4) (Kalaghoda - Akota) 1.31 Km which fall in three districts of central Gujarat Anand Kheda, and Vadodara was taken under study (figure:1). All the sites are rain-fed as well as receive water through canals. Primarily water is used for irrigation, domestic usage, and rearing and stocking of Indian major carp.

Field Data Collection: Standard operating protocols (Arya et al., 2019) were used for the survey. Between October 2021 and February 2022, all sites were visited twice a month for the study. Scanning for the birds was done on selected vantage points while walking around the edge of the pond or river, keeping a safe distance from birds. Bird identification was done with the help of Nikon Aculon binocular A211 (8 X 42) and a handbook of Birds of the Indian subcontinent (Grimmett et al., 2016). Photographs were also captured for validation through a Nikon D3500 DSLR camera. The study area map was designed with the help of Quantum GIS Software, and the graph was generated using free software Microsoft Excel and R studios.

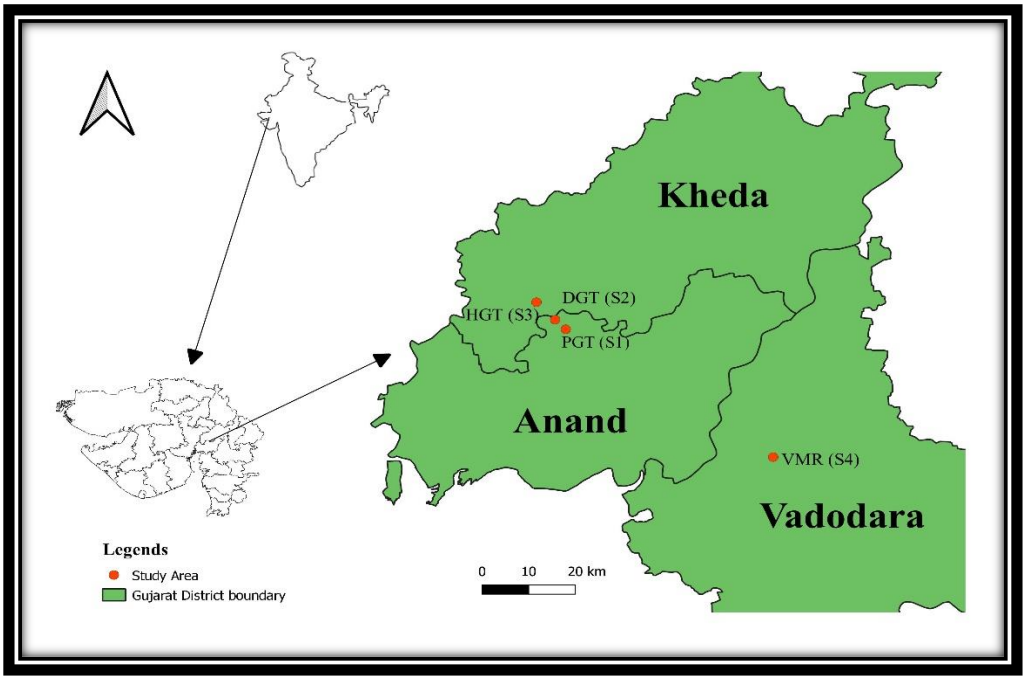

Figure: 1 Study Area. (PGT- Petli Gam Talav, DGT - Deva Gam Talav, HGT - Heranj Gam Talav, VMR – Vishvamitri River)

RESULT AND DISCUSSION

A total of 69 species have been recorded from all the four sites PGT S1, DGT S2, HGT S3, and VMR S4. Among them, maximum species were recorded from HGT S3 with 66, followed by DGT S2 with 54, VMR S4 with 30, and least with 25 at PGT S1 (Figure: 2).

Out of total orders, Passeriformes have 17 species, Pelecaniformes have 12, Charadriiformes have 7, Anseriformes and Coraciiformes have 5, Accipitriformes, Ciconiiformes and Gruiformes have 3, Columbiformes Galliformes Piciformes Psittaciformes Strigiformes, Suliformes have 2 and Apodiformes and Bucerotiformes with 1 (Figure: 3).

Overall, avifaunal diversity reveals that the maximum number of a family (38) with a maximum of Ardeidae were recorded during the study period. The most prevalent visitors at the sites were insectivorous birds, followed by granivorous, omnivorous, frugivorous, nectarivorous, and carnivorous species. Fishing activity was seen throughout the study period at the three sites (PGT S1, DGT S2, HGT S3), as well as significant agriculture activity during the late monsoon and winter season was observed. Many tourists and environment enthusiasts also came to see them, but such human activities may not pose a threat to their existence. VMR S4 has the addition of industrial effluents and other domestic discharges, impacting the biodiversity and health of the ecosystem

(Magadum et al., 2017). The migratory bird population was dominant in the HGT S3 site due to the topography of the wetlands, which supports a greater number of water birds. Site DGT S2 and HGT S3 had the world's most giant flying bird Sarus crane, which is vulnerable according to IUCN. The checklist of identified Avifaunal species is as below (Table: 1). Similar finding was also done by (Bhandarkar and Paliwal, 2014; Parihar et al., 2020)

According to a four-way Venn diagram, all four sites share a total of 19 bird species in common *(Figure 4)*. In DGT S2, there are two distinct species, while in HGT S3, there are 14 unique species. In PGT S1 and VMR S4, there are no distinct species. In DGT S2 and HGT S3, there are seventeen common species. HGT S3 and PGT S1 share one same species. DGT S2, HGT S3, and VMR S4 share ten species. There are five common species in HGT S3, DGT S2, and PGT S1.

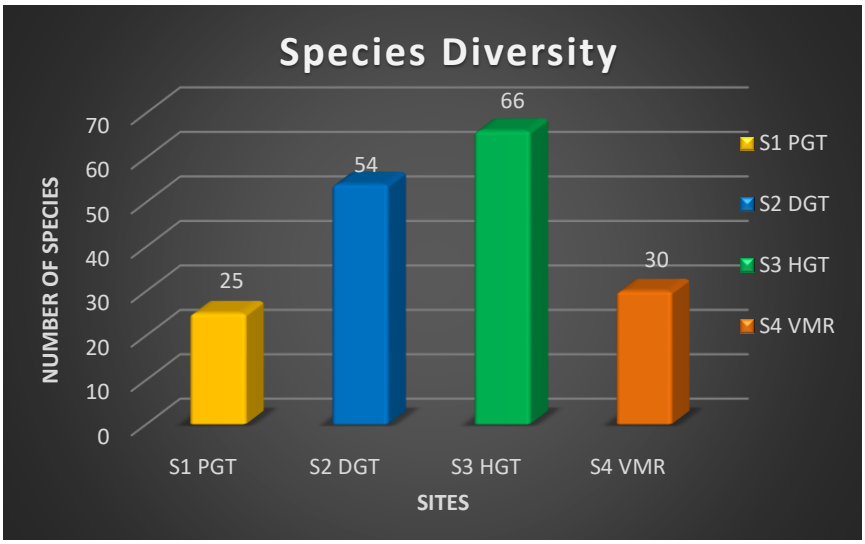

Figure: 2 Species Diversity

Figure 3: Order Distribution

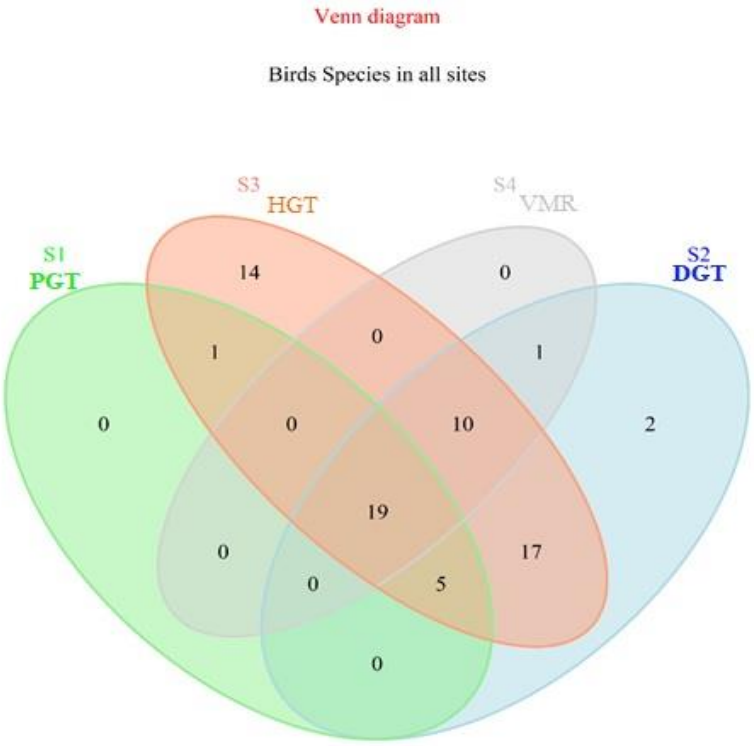

Figure: 4 Four-way Venn diagram Birds Species in all sights.

Table: 1 Checklist of Avifauna recorded in the study area.

Family	Common Name	Scientific Name	S1 PGT	S2 DGT	S3 HGT	S4 VMR	IUCN Status
Accipitridae	Crested honey buzzard	*Pernis ptilorhynchus*	-	-	+	-	LC
	Black winged kite	*Elanus caeruleus*	-	+	+	-	LC
	Shikra	*Accipiter badius*	-	+	+	+	LC
Alcedinidae	White-throated kingfisher	*Halcyon smyrnensis*	+	+	+	-	LC
	Common kingfisher	*Alcedo atthis*	-	+	+	+	LC
	Pied kingfisher	*Ceryle rudis*	+	+	+	-	LC
Anatidae	Ruddy shelduck	*Tadorna ferruginea*	-	-	+	-	LC
	Knob-billed duck	*Sarkidiornis melanotos*	-	-	+	-	LC
	Garganey	*Spatula querquedula*	-	-	+	-	LC
	Graylag goose	*Anser anser*	-	-	+	-	LC
	Lesser whistling duck	*Dendrocygna javanica*	-	-	+	-	LC
Anhingidae	Oriental darter	*Anhingidae*	-	-	+	-	NT
Apodidae	Little swift	*Apus nipalensis*	+	+	+	-	LC

Ardeidae	Little egret	*Egretta garzetta*	+	+	+	+	LC
	Pond heron	*Ardeola*	+	+	+	+	LC
	Purple heron	*Ardea purpurea*	-	+	+	-	LC
	Great egret	*Ardea alba*	-	+	+	-	LC
	Cattle egret	*Bubulcus ibis*	+	+	+	+	LC
	Black-crowned Night-Heron	*Nycticorax nycticorax*	-	+	-	+	LC
	Yellow Bittern	*Ixobrychus sinensis*	-	+	-	-	LC
	Intermediate Egret	*Ardea intermedia*	-	+	+	+	LC
Charadriidae	Red-wattled lapwing	*Vanellus indicus*	+	+	+	+	LC
Ciconiidae	Painted stork	*Mycteria leucocephala*	-	+	+	-	NT
	Asian openbill	*Anastomus oscitans*	-	-	+	-	LC
	Woolly-necked Stork	*Ciconia episcopus*	-	+	+	-	NT
Columbidae	Rock dove	*Columba livia*	+	+	+	+	LC
	Spotted dove	*Spilopelia chinensis*	-	+	+	+	LC
Coraciidae	Indian Roller	*Coracias benghalensis*	-	-	+	-	LC
Corvidae	Large-billed crow	*Corvus macrorhynchos*	-	+	+	+	LC
	Rufous Treepie	*Dendrocitta vagabunda*	-	+	+	+	LC
	House Crow	*Corvus splendens*	+	+	+	+	LC
Dicruridae	Black drongo	*Dicrurus macrocercus*	+	+	+	+	LC
Estrildidae	Indian silverbill	*Euodice malabarica*	-	+	+	-	LC
Gruidae	Sarus crane	*Grus antigone*	-	+	+	-	VUL
Hirundinidae	Wire-tailed Swallow	*Hirundo smithii*	-	+	+	-	LC
Jacanidae	Bronze-winged jacana	*Metopidius indicus*	-	+	+	-	LC
	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	-	-	+	-	LC
Laridae	River tern	*Sterna aurantia*	-	-	+	-	VUL
Leiothrichidae	Common babbler	*Turdoides caudata*	+	+	+	+	LC
	Jungle babbler	*Turdoides striata*	+	+	+	+	LC
Megalaimidae	Coppersmith Barbet	*Megalaima haemacephala*	-	+	+	-	LC
Meropidae	Green bee-eater	*Merops orientalis*	+	+	+	+	LC
Motacillidae	White wagtail	*Motacilla alba*	-	+	+	+	LC
Muscicapidae	Indian robin	*Saxicoloides fulicatus*	-	+	+	+	LC
	Oriental magpie-robin	*Copsychus saularis*	+	+	+	+	LC
Nectariniidae	Purple Sunbird	*Cinnyris asiaticus*	+	+	+	+	LC
Oriolidae	Indian golden oriole	*Oriolus kundoo*	-	+	-	-	LC
Passeridae	House sparrow	*Passer domesticus*	-	+	+	-	LC

Phalacrocoracidae	Little Cormorant	*Microcarbo niger*	-	+	+	-	LC
Phasianidae	Grey francolin	*Francolinus pondicerianus*	-	-	+	-	LC
	Indian Peafowl	*Pavo cristatus*	+	+	+	+	LC
Picidae	Black-rumped Flameback	*Dinopium benghalense*	-	+	+	+	LC
Psittaculidae	Plum-headed parakeet	*Psittacula cyanocephala*	+	-	+	-	LC
	Rose-ringed Parakeet	*Psittacula krameri*	+	+	+	-	LC
Pycnonotidae	White eared bulbul	*Pycnonotus*	-	-	+	-	LC
	Red-vented Bulbul	*Pycnonotus cafer*	+	+	+	+	LC
Rallidae	White-breasted waterhen	*Amaurornis phoenicurus*	+	+	+	+	LC
	Purple swamphen	*Porphyrio porphyrio*	+	+	+	-	LC
Recurvirostridae	Black-winged stilt	*Himantopus himantopus*	+	+	+	+	LC
Scolopacidae	Common Sandpiper	*Actitis hypoleucos*	-	+	+	-	LC
	Black-tailed godwit	*Limosa limosa*	-	-	+	-	NT
Strigidae	Spotted owlet	*Athene brama*	+	+	+	+	LC
Sturnidae	Common myna	*Acridotheres tristis*	+	+	+	+	LC
Threskiornithidae	Eurasian spoonbill	*Platalea leucorodia*	-	+	+	-	LC
	Black-headed ibis	*Threskiornis melanocephalus*	-	+	+	+	NT
	Red-naped ibis	*Pseudibis papillosa*	+	+	+	+	LC
	Glossy ibis	*Plegadis falcinellus*	-	+	+	-	LC
Tytonidae	Barn owl	*Tyto alba*	-	+	+	-	LC
Upupidae	Eurasian Hoopoe	*Upupidae*	-	+	+	-	LC
	Total 69		25	54	66	30	

Abbreviation: LC: Least Concern, VUL: Vulnerable, NT: Near Threatened

CONCLUSION

A study concluded to get the baseline data in four sites, PGT S1, DGT S2, HGT S3, and VMR S4, supports a good diversity of bird species. The study reveals a total of 69 species of birds recorded in all sites. Among them, maximum species were recorded from HGT S3 with 66, followed by DGT S2 with 54, VMR S4 with 30, and most minor with 25 at PGT S1. To Maintain biodiversity richness, it is essential to conserve the ideal ecosystem. No man-made intervention should be allowed, and attempts should be made by the concerned authorities and local population to protect biodiversity.

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