Research Article

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Current status and diversity of water birds in Jogmaya Sarovar (Ranjan Dih), Purulia district, West Bengal

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Abstract
Waterbirds are generally understood to be birds that use wetlands for breeding, foraging, and roosting. In addition to being excellent markers of a wetland's health, wetland birds have a substantial impact on human culture, society, science, and food availability. These birds are clearly attractive to humans and have been mentioned in numerous ancient epics. The purpose of the current communication is to provide information on the water birds that can be found in the Jogmaya Sarovar or Ranjandih of Purulia district. Those birds who use this man made water body as a feeding and foraging ground are the subject of this communication. According to surveys undertaken on the Jogmaya Sarovar between January 2022 and March 2023, there are 33 species under 27 genera, which are divided into 15 families belonging to 10 orders. There are thought to be 12% local migrants, 18% migratory birds, and 70% resident birds. Moreover, 79% of the bird species of this lake reported from edge of the waterbody and rest (21%) found inside the waterbody.

Keywords: Jogmaya Sarovar, Kashipur, Purulia, Water birds

1. Introduction

By supplying water for irrigation, drinking, and energy, dams have assisted in the socio-economic growth of people. At the same time, however, they also provide ecological services and important habitats for water birds. Water birds are one of the most blatant indicators of the richness and diversity of these productive ecosystems because they can be found on wetlands (natural or artificial), frequently in spectacular densities. Ranjandih or Jogmaya Sarovar dam is located on the Kangsavati river, which is the lifeline of this region. In the Purulia district, this medium-sized artificial lake is situated 5.5 kilometres from Kashipur town and 13 kilometres from Adra station. Unfortunately, little is known about the variety of water birds that inhabit this artificially created wetland in the Purulia district. Keeping on view, a study was done to investigate the richness and current status of aquatic avi- fauna of this dam. According to ornithological investigations, this unfamiliar water body hosts 33 species of water-associated birds from 10 orders and 15 families during the winter.

2. Material and methods:

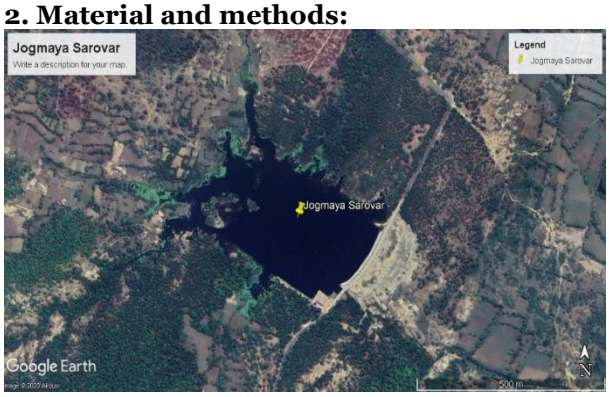

Fig.1: Location of the Jogmaya Sarovar (Study area)

Study area:

Medium-sized man-made lake Jogmaya Sarovar dam is situated near Dhatla village in Kashipur community development block of Purulia district (23°23'55.25"N, 86°42'11.04"E) (Fig1). The lake is named after the local political leader's “Mother Jogmaya”. Ranjandih dam is another name for this lake. The dam, which was constructed in Purulia for irrigation needs in the 1970s, is now a popular tourist destination. The dam's reservoir has a water storage capacity of 0.66 million cubic metres and a surface area of around 2.5 square kilometres.
Because of its resemblance to this habitat, this dam is sometimes referred to as the "Little Sundarban" of Purulia, without any mangrove plants. Acacia auriculiformes and other trees, including Terminalia bellirica, Borassus flabellifer, and Butea monosperma, are the main vegetation surrounding this dam. The lake is made more beautiful by a few dry Acacia auriculiformes (Fig.7b) on the bank (Fig.7c) and island (Fig.7 e), where several birds have rested on their branches. Since the water is clear and open, a variety of fish live there. Nymphoides hydrophylla (Fig.7d) is the most prevalent aquatic plant and is largely present

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around the dam's edge. Inside the water body, there are one to two islets that provide shelter to the migratory birds. [28].

Methodology:

In order to monitor and catalogue the migratory and resident birds found in this wetland, the study was carried out from January to March in 2022 and 2023 (only during the winter season). Several aquatic birds congregate here throughout the winter months. For in-person observation, a binocular (Olympus Binocular 10x50) was employed. From 7:00 am until 5:00 pm, a Nikon B600 camera was utilised to shoot the various species. The checklist was created in accordance with Grimmett et al. [1].

33 species of water-associated birds from 10 orders and 15 families were documented as part of the current survey. In table-1, all the details about their dispersal status, habitats, common names, scientific names, and current taxonomic status are incorporated. All the species encountered during this survey are classified as least concerned (LC).

3. Results:

Table1: List of water bird species observed in Jogmaya Sarovar

No.	**Common Name**	**Scientific Name**	**Dispersal status** Resident **(R),** Local Migrant **(LM**), Migrant **(M)**	**Habitat status** Inside water body (**IWB**), Edge of the water body (**EWB**).
A. Order: Anseriformes				
1. Family: Anatidae				
1	Lesser Whistling-duck	*Dendrocygna javanica* (Horsfield, 1821)	LM	IWB
2	Gadwall	*Mareca strepera* (Linnaeus, 1758)	M	IWB
B. Order: Podicipediformes				
2. Family: Podicipedidae				
3	Little Grebe	*Tachybaptus ruficollis* (Pallas, 1764)	R	IWB
C. Order: Ciconiiformes				
3. Family: Ciconiidae				
4	Asian Openbill	*Anastomus oscitans* (Boddaert, 1783)	R	EWB
D. Order: Pelecaniformes				
4. Family: Threskiornithidae				
5	Red-naped Ibis	*Pseudibis papillosa* (Temminck, 1824)	R	EWB
5. Family: Ardeidae				
6	Striated Heron	*Butorides striata* (Linnaeus, 1758)	R	EWB
7	Black-crowned Night Heron	*Nycticorax nycticorax* (Linnaeus, 1758)	R	EWB
8	Indian Pond Heron	*Ardeola grayii* (Sykes, 1832)	R	EWB
9	Cattle Egret	*Bubulcus ibis* (Linnaeus, 1758)	R	EWB
10	Great Egret	*Ardea alba* Linnaeus, 1758	R	EWB
11	Intermediate Egret	*Ardea intermedia* Wagler, 1829	R	EWB
12	Little Egret	*Egretta garzetta* (Linnaeus, 1766)	R	EWB
E. Order: Suliformes				
6. Family: Phalacrocoracidae				
13	Little Cormorant	*Microcarbo niger* (Vieillot, 1817)	R	IWB
14	Indian Cormorant	*Phalacrocorax fuscicollis* Stephens, 1826	R	IWB
15	Great Cormorant	*Phalacrocorax carbo*(Linnaeus, 1758)	LM	IWB
F. Order: Accipitriformes				
7. Family: Pandionidae				
16	Osprey	*Pandion haliaetus* (Linnaeus, 1758)	M	EWB
G. Order: Gruiformes				
8. Family: Rallidae				

17	White-breasted Waterhen	*Amaurornis phoenicurus* (Pennant, 1769)	R	EWB
18	Grey-headed Swamphen	*Porphyrio poliocephalus* (Linnaeus, 1758)	R	EWB
19	Common Moorhen	*Gallinula chloropus* (Linnaeus, 1758)	R	IWB
9. Family: Jacanidae				
20	Pheasant-tailed Jacana	*Hydrophasianus chirurgus* (Scopoli, 1786)	R	EWB
21	Bronze-winged Jacana	*Metopidius indicus* (Latham, 1790)	R	EWB
H. Order: Charadriiformes				
10. Family: Burhinidae				
22	Indian Thick-knee	*Burhinus indicus* (Salvadori, 1865)	R	EWB
11. Family: Charadriidae				
23	Yellow-wattled Lapwing	*Vanellus malabaricus* (Boddaert, 1783)	LM	EWB
24	Grey headed Lapwing	*Vanellus cinereus* (Blyth, 1842)	M	EWB
25	Red-wattled Lapwing	*Vanellus indicus* (Boddaert, 1783)	R	EWB
12. Family: Scolopacidae				
26	Common Sandpiper	*Actitis hypoleucos* Linnaeus, 1758	M	EWB
I. Order: Coraciiformes				
13. Family: Alcedinidae				
27	Stork-billed Kingfisher	*Pelargopsis capensis* (Linnaeus, 1766)	R	EWB
28	White-breasted Kingfisher	*Halcyon smyrnensis* (Linnaeus, 1758)	R	EWB
29	Common Kingfisher	*Alcedo atthis* (Linnaeus, 1758)	R	EWB
J. Order: Passeriformes				
14. Family: Hirundinidae				
30	Barn Swallow	*Hirundo rustica* Linnaeus, 1758	LM	EWB
15. Family: Motacillidae				
31	Western Yellow Wagtail	*Motacilla flava* (Linnaeus, 1758)	M	EWB
32	White Wagtail	*Motacilla alba* (Linnaeus, 1758)	M	EWB
33	White-browed Wagtail	*Motacilla maderaspatensis* (Gmelin, 1789)	R	EWB

Abb. used: DS- Dispersal status, **R**- Resident, **LM**- Local Migrant, **M**- Migrant; **HS**-Habitat status, **IWB**- Inside water body, **EWB**- Edge of the water body.

The order Pelecaniformes, which comprises 8 species, is the most speciose among the 10 order of birds reported from Jogmaya Sarovar. Following it are the Gruiformes and Charadriiformes (each with five species), Passeriformes (four), Suliformes and Coraciiformes (each with three species), Anseriformes (two), and the remaining three families (with one species each) (Fig.2).

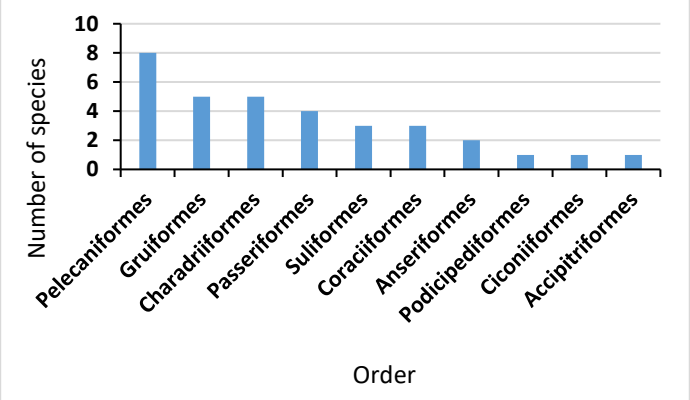

Fig. 2: Number of bird species reported from Jogmaya Sarovar (Order-wise)

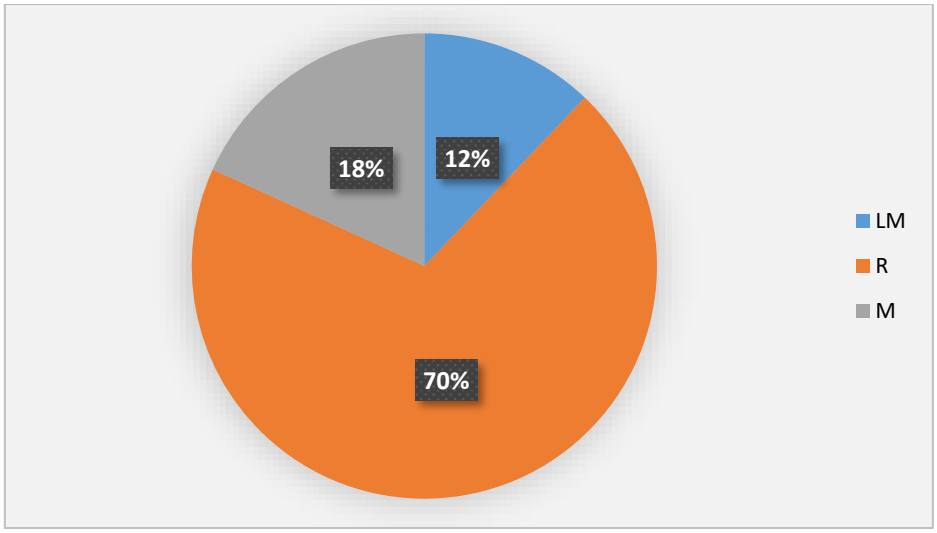

Fig. 3: Residential status of observed water birds in Jogmaya Sarovar

70% of the bird species from Jogmaya Sarovar were found to bes resident species during this survey. In this water body, only 18% and 12% of species are migratory and local migrants, respectively (Fig.3). All of the observed species are further divided into two groups based on where they forage: those that do so within the water body (IWB), which includes open and shallow water areas; and those that do so close to the edge of the water body (EBW), which includes swampy zones, small grass land along the water body.

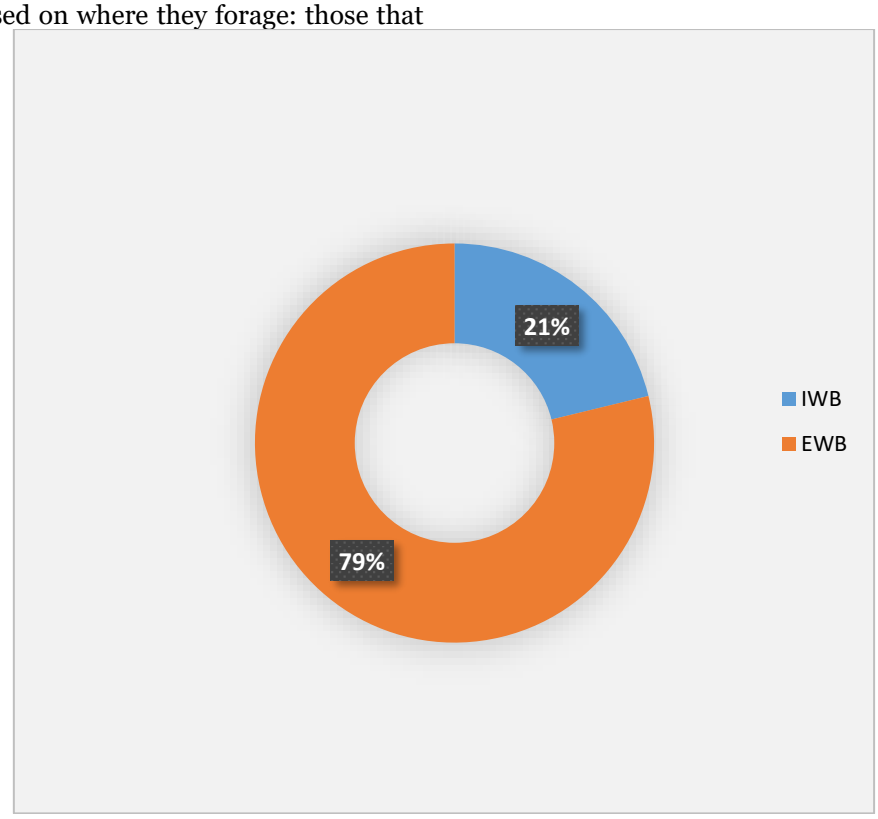

Fig4: Species diversity among IWB & EWB (in percent)

Fig.5. Pictorial presentation of some aquatic birds of Jogmaya Sarovar: a) *Dendrocygna javanica* (Lesser Whistling-duck), b) *Mareca strepera* (Gadwall), c) *Tachybaptus ruficollis* (Little Greb), d) *Anastomus oscitans* (Asian Openbill), e) *Pseudibis papillosa* (Red-naped Ibis), f) *Butorides striata* (Striated Heron), g) *Nycticorax nycticorax* (Black-crowned night Heron), h) *Ardeola grayii* (Indian Pond Heron), i) *Bubulcus ibis* (Cattle Egret), j) *Ardea alba* (Great Egret), k) *Ardea intermedia* (Intermediate Egret), l) *Egretta garzetta* (Little Egret), m) *Microcarbo niger* (Little Cormorant), n) *Phalacrocorax fuscicollis* (Indian Cormorant), o) *Phalacrocorax carbo* (Great Cormorant), p) *Pandion haliaetus* (Osprey)

Fig.6. Pictorial representation of some aquatic birds of Jogmaya Sarovar : a) *Amaurornis phoenicurus* (White-breasted Waterhen), b) *Porphyrio poliocephalus* (Grey-headed Swamphen), c) *Gallinula chloropus* (Common Moorhen), d) *Hydrophasianus chirurgus* (Pheasant-tailed Jacana), e) *Metopidius indicus* (Bronze-winged Jacana), f) *Burhinus indicus* (Indian Thick-knee), g) *Vanellus malabaricus* (Yellow Wattled Lapwing), h) *Vanellus cinereus* (Grey headed Lapwing), i) *Vanellus indicus* (Red Wattled Lapwing), j) *Actitis hypoleucos* (Common sandpiper), k) *Pelargopsis capensis* (Stork-billed Kingfisher), l) *Halcyon smyrnensis* (White Breasted Kingfisher), m) *Alcedo atthis* (Common Kingfisher), n) *Motacilla flava* (Western Yellow wagtail), o) *Motacilla alba* (White wagtail), p) *Motacilla maderaspatensis* (White-browed wagtail)

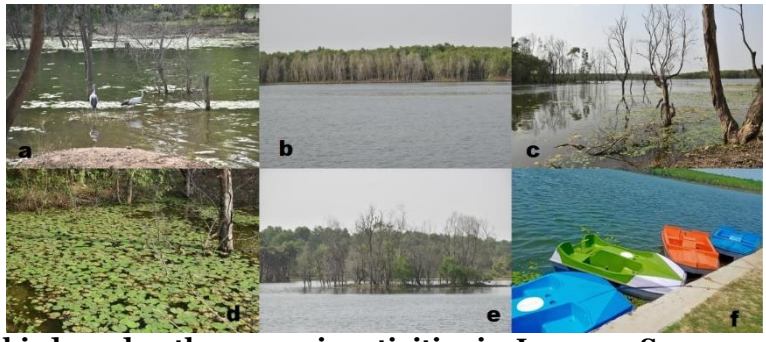

Fig.7. Habitats of birds and anthropogenic activities in Jogmaya Sarovar: a) Asian Open bill in swampy zone, b) vegetation surrounding the water body, c) bank of the lake, d) colony of *Nymphoides hydrophylla*, e) natural Islands, f) tourist boat

4. Discussion:

Understanding global patterns of biodiversity change is crucial for conservation research, policies and practices [2]. Due to careless human activity during the past century, around half of the world's natural wetlands—including those in India—have vanished, while the others have had varying effects [3]. At the same time, the number of artificial wetlands, such as aquaculture ponds, mine impoundments, reservoirs, irrigation ponds, etc., has expanded globally. These wetlands offer waterbirds an alternate habitat that is frequently suitable [3]. Unfortunately, much like other natural waterbodies, these manmade waterbodies are increasingly popular tourist destinations, which means that anthropogenic activity is continuing to rise. This has an adverse effect on the variety and aggregation of the bird population. According to Hazra [3], three significant wetlands in the Purulia district are currently in danger which previously used to host a diverse range of waterbirds. All three wetlands are currently faced with serious problems like habitat loss, pollution, unrestricted tourism activities, etc. In another study [4], stated that, unplanned farming methods, the use of pesticides & other harmful chemicals, floating plastic bottles & packages, and sound pollution from high decibel sound boxes affected the negative impact on aggregation and diversity of avian population in Chupi lake of Bardhaman district. Recently, a study conducted by [5], on the effects of anthropogenic activities on bird diversity in an urban waterbody (Bhoj Wetland), Bhopal, Madhya Pradesh, India and it was revealed that, habitat destruction being the most detrimental activity than other human activities.

From this small water body, a total of 33 species of water-associated birds were recorded which indicates this place is at present good habitat for winter bird community. During this study, it has been found that, Lesser Whistling-Duck (Fig.5a) was the most abundant species and roosted on the islands during daytime giving a natural beauty of this place. Other important migratory birds of this water body were Gadwall (Fig.5b), Osprey (Fig. 5p), Grey-headed Lapwing (Fig.6h) and Common Sandpiper (Fig.6j) etc. Some other important residential birds are Striated Heron (Fig.5f) which was seen on the Borassus flabellifer, Pheasant-tailed Jacana (Fig.6d) was seen foraging at close to water edge (EWD), and Indian Thick-knee (Fig.6f) was seen at the bank of the dam.

This is the first attempt at examining the variety of water birds in the Jogmaya Sarovar in the Purulia district. The current list of bird species is not exhaustive, but it will be useful to researchers and bird watchers as they continue their extensive long-term studies in this area and for the conservationists for making their future plan of work related to management.

5. Conclusion:

Before the widespread deterioration began, this water body had already demonstrated its capacity to make for the perfect waterbird habitat. Thus, effective management of this wetland through various organisations and sectors is necessary to keep up an optimal ecology for the survival of bird assemblages. Although there are many restrictions, it is still important to regulate boating (Fig. 7f) and the dumping of plastics into lakes. Bird poaching is an issue in this location; therefore, forest agencies have to be more vigilant.

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CONFLICT OF INTEREST:

The author declares that there are no conflicts of interest.

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