Octa Journal of Environmental Research
International Peer-Reviewed Journal
Oct. Jour. Env. Res. Vol. 5(3):162-168
Available online http://www.sciencebeingjournal.com

Jul. – Sept., 2017
ISSN 2321 3655

Research Article

Octa Journal of Environmental Research
(Oct. Jour. Env. Res.) ISSN: 2321-3655
Journal Homepage: http://www.sciencebeingjournal.com

STATUS OF AVIAN DIVERSITY AND THEIR POPULATION IN SAMOHA DAM DISTRICT SHIVPURI, MADHYA PRADESH

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Received: 19th Jun. 2017 **Revised**: 29th Jun. 2017 **Accepted**: 30th Jul. 2017

Abstract: Bird diversity plays an important role for the endangered ecosystem, because birds are good indicator species and their presence shows the overall health of the system. The study was carried out at Samoha Dam which is highly productive and unique ecosystem that supports large number of birds, for the period of one year during June 2015 to May 2016. In the present study total 57 species of were recorded belonging to 34 families and 28 order. Bird Diversity was calculated by using the Shannon-Weinner Index methods to compare the avifaunal diversity of the study area.
Keywords: Avifauna; Diversity; Habitat; Population; Samoha Dam.
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INTRODUCTION

Water bodies are considered as a key factor that affects aquatic vegetation, composition and food resources that effects birds population, diversity and distribution (Colwell and Taft 2000). Wetlands and water birds are inseparable elements and support a rich array of water bird communities (Grimmett and Inskipp, 2007). Local people used the wetlands for various purposes for their livelihood, fishing, agriculture, irrigation, bath washing, grazing, grass cutting which cause the factors of degradation of wetland ecosystem, leads to the destruction of habitat of aquatic avifauna (Manakadan *et al*., 2011). The abundance of avifauna indicates the healthy status of lakes owing the availability of water, safe habitat and food sources for both adults and nestlings, and essential nesting/ roosting sites in and around the lakes are important abundance of aquatic bird populations (Joshi, 2012). Avifaunal diversity has been decreasing due to the destruction of natural habitats and human disturbances (Bhadja and Vaghela, 2013). The shallow open water and marshy area supports a variety of aquatic and semi aquatic vegetation that provides an adequate food spectrum and good habitation for the living of the wetland birds (Arya *et al.* 2014). Birds are essential to maintain ecosystem and tropic level. They play a functional role in the ecosystem as potential pollinators and scavengers and are rightly called as bioindicators (Puri and Virani, 2016). Thus avifaunal study is essential on Samoha Dam in Shivpuri district to conserve the biodiversity and its habitat.

EXPERIMENTAL

Study Area: Current study was carried out at Shivpuri district which is located in the northern part of the Madhya Pradesh state. The district mostly consists of small hills and forests. Shivpuri district is located about 110 km away from Gwalior division of northwest Madhya Pradesh at an altitude of 1,515 feet (462 m) above sea level. It is famous for beauty of nature with rich biodiversity. Samoha Dam is a perennial water source on the eastern side of Karera Bustard Sanctuary. The Dam is constructed on the tributary of Mahuar and Bilrau River. It is located 16 km away from Karera town. The Dam has rocky, muddy and

sandy banks. It is also surrounded by hills on eastern side. The shoreline has steep or moderate slopes. The banks at west and southern part have patchy forest cover. It has maximum depth of about 15 m. The depth of this reservoir varies on various places and its basin shows the presence of sandy loam and clay soil. The water level fluctuates over 4 meters between wet and dry season.

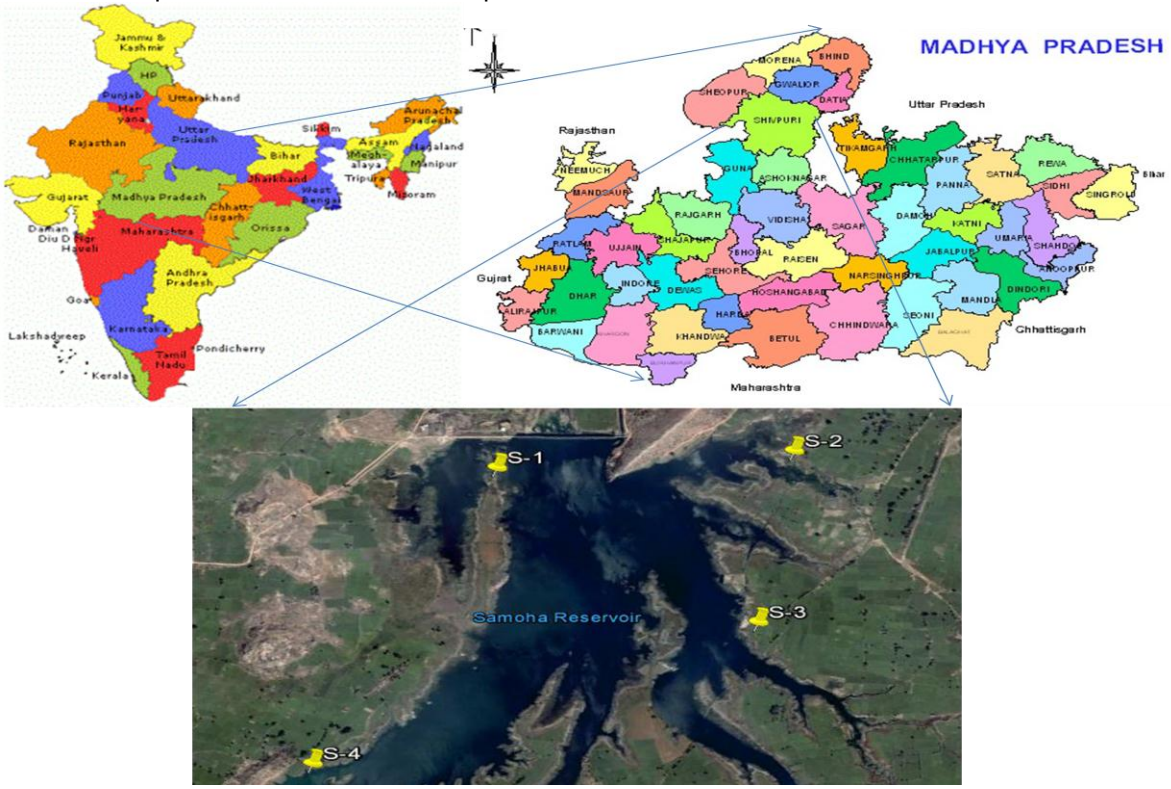

Figure 1. Location of Selected site at Samoha Dam

Data collection and compilation: Data was collected seasonally thought the year from June 2015 to May 2016. The study area visited every month between 07:00 hours to 11:00 hours and 14:00 hours to 18:30 hours during summer and 08:00 hours to 11:30 hours and 14:00 to 17:00 hours during winter season, whole the year last to first week of month regular interval. Bird species were counted at the selected sites through the handling of instrument by the Line Transect and Point count methods (Bibi and Ali, 2013). The birds were identified using field guide books Ali, 1996; Grimmett, *et al.,* 1999). External morphology, Songs and calls and Habitats characteristics were applied to identify the bird species. The English, scientific and local names of the birds were taken (Ali, 1996 and Hurvey, 1990) and taxonomy according to Ripley and Dillon (1958) and Inskipp *et al.,* (1996). The bird species were categorized based on their IUCN status. Bird were also classified as resident, Migrant, and residential Migrant. Shannon Wiener diversity index were studied to find out the diversity of bird in study sites.

RESULTS AND DISCUSSION

The checklist was prepared on bird species with their order, family, scientific name, Species name and IUCN status in and around Samoha Dam given in table 1. A total 5546 individual birds representing 57 species, 18 families, and 9 orders were observed during the survey at all sites in different season. Monthly fluctuation of birds in Samoha Dam is given at different sites at different season (Table 2). Charadriiformes order is more dominant in the study area, including 6 families and 19 species (Figure 2). Four near threatened (Black-tailed Godwit, Black-headed Ibis, Oriental Darter and Painted Stork), one vulnerable species (Common Pochard) according to IUCN red data book were found in this study area. Remaining all

other species found during the survey is categorized as least concerned. The bird population changes in this study area in different seasons due to local environmentally dependent factor, agricultural activities , water availability, local and regional habitat changes and climatic condition same study were found on Purbasthali Oxbow Lake by (Chowdhury, 2015). Kukade *et al.,* (2011) recorded 68 species from Chhatri lake of Amravati district. Puri and Virani (2016) recorded 90 species form chorkhamara reservoir in Gondia district and Odewumi (2017) observed 35 bird species belonging to 20 families and 10 orders with more dominancy.

Table 1. Systematic Checklist of birds observed at Samoha Dam district Shivpuri (MP) India

S.No.	Order	Family	Scientific Name	Species Name	IUCN Status
1.	Charadriiformes	Scolopacidae	*Tringa stagnatilis*	Marsh Sandpiper	LC
2.			*Tringa ochropus*	Green Sandpiper	LC
3.			*Calidris minuta*	Little Stint	LC
4.			*Tringa tetanus*	Common Redshank	LC
5.			*Actitis hypoleucos*	Common Sandpiper	LC
6.			*Tringa glareola*	Wood Sandpiper	LC
7.			*Tringa erythropus*	Spotted Redshank	LC
8.			*Gallinago gallinago*	Common Snipe	LC
9.			*Limosa limosa*	Black-tailed Godwit	NT
10.			*Calidris ferruginea*	Curlew Sandpiper	LC
11.		Charadriidae	*Charadrius hiaticula*	Common Ringed Plover	LC
12.			*Charadrius dubius*	Little Ringed Plover	LC
13.			*Vanellus indicus*	Red-wattled Lapwing	LC
14.			*Vanellus malabaricus*	Yellow-wattled Lapwing	LC
15.		Jacanidae	*Metopidius indicus*	Bronze-winged Jacana	LC
16.			*Hydrophasianus chirurgus*	Pheasant-tailed Jacana	LC
17.		Laridae	*Sterna aurantia*	River Tern	LC
18.		Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	LC
19.		Burhinidae	*Burhinus oedicnemus*	Eurasian Thick-knee	LC
20.	Pelecaniformes	Ardeidae	*Ardea cinerea*	Grey Heron	LC
21.			*Ardea alba*	Great White Egret	LC
22.			*Ardea intermedia*	Intermediate Egret	LC
23.			*Egretta garzetta*	Little Egret	LC
24.			*Bubulcus ibis*	Cattle Egret	LC
25.			*Ardeola grayii*	Indian Pond-Heron	LC
26.			*Nycticoraxnycticorax*	Black-Crowned Night Heron	LC
27.			*Ardea purpurea*	Purple heron	LC
28.		Threskiornithidae	*Platalea leucorodia*	Eurasian spoonbill	LC
29.			*Eudocimus albus*	White Ibis	LC
30.			*Threskiornis melanocephalus*	Black-headed Ibis	NT
31.			*Pseudibis papillosa*	Red-naped Ibis	LC
32.	Anseriformes	Anatidae	*Dendrocygna javanica*	Lesser Whistling-duck	LC
33.			*Tadorna ferruginea*	Ruddy Shelduck	LC
34.			*Nettapus coromandelianus*	Cotton teal	LC
35.			*Sarkidiornis sylvicola*	American Comb Duck	LC
36.			*Aythya ferina*	Common Pochard	VU
37.			*Anas acuta*	Northern Pintail	LC
38.			*Anas crecca*	Common Teal	LC
39.	Passeriformes	Motacillidae	*Motacilla tschutschensis*	Eastern Yellow Wagtail	LC
40.			*Motacilla cinerea*	Grey wagtail	LC

41.			*Motacilla alba*	White Wagtail	LC
42.			*Motacilla maderaspatensis*	White-browed Wagtail	LC
43.		Alaudidae	*Eremopterix griseus*	Ashy-crowned Sparrow-lark	LC
44.	Coraciiformes	Alcedinidae	*Ceryle rudis*	Pied Kingfisher	LC
45.			*Halcyon smyrnensis*	White-breasted Kingfisher	LC
46.			*Alcedo atthis*	Common Kingfisher	LC
47.		Coraciidae	*Coracias benghalensis*	Indian Roller	LC
48.	Suliformes	Phalacrocoracidae	*Microcarbo niger*	Little cormorant	LC
49.			*Phalacrocorax carbo*	Great Cormorant	LC
50.		Anhingidae	*Anhinga melanogaster*	Oriental Darter	NT
51.	Gruiformes	Rallidae	*Fulica atra*	Common Coot	LC
52.			*Gallinula chloropus*	Common Moorhen	LC
53.			*Amaurornis phoenicurus*	White-breasted Waterhen	LC
54.	Ciconiiformes	Ciconiidae	*Mycteria leucocephala*	Painted Stork	NT
55.			*Ciconia nigra*	Black Stork	LC
56.			*Anastomus oscitans*	Asian openbill	LC
57.	Podicipediformes	Podicipedidae	*Podiceps cristatus*	Great Crested Grebe	LC

IUCN Status: **NT**- Near threatened, **VC**- Vulnerable, **LC**- Least concern

Table 2. Total Population of Birds in Samoha Dam (MP) during 2015 to 2016

S.No.	Name of Species	Rainy Season				Winter Season				Summer Season			
		S-1	S-2	S-3	S-4	S-1	S-2	S-3	S-4	S-1	S-2	S-3	S-4
1.	Marsh Sandpiper	2	8	9	17	2	10	16	24	5	3	9	5
2.	Green Sandpiper	5	1	14	9	16	4	26	22	13	2	15	21
3.	Little Stint	5	1	6	10	2	3	7	10	5	3	23	9
4.	Common Redshank	0	0	0	1	0	0	0	2	3	1	4	15
5.	Common Sandpiper	4	2	3	13	10	2	13	10	10	2	6	6
6.	Wood Sandpiper	0	0	0	0	1	0	2	7	0	0	3	0
7.	Spotted Redshank	0	0	5	2	0	0	0	0	0	0	0	0
8.	Common Snipe	0	0	2	0	0	1	0	9	0	1	2	5
9.	Black-tailed Godwit	0	0	0	0	14	4	23	18	2	0	1	1
10.	Curlew Sandpiper	0	0	0	0	4	7	6	8	5	1	3	6
11.	Common Ringed Plover	1	0	0	0	7	2	5	14	7	2	3	8
12.	Little Ringed Plover	4	1	1	7	0	0	0	0	3	2	4	2
13.	Red-wattled Lapwing	12	8	12	16	12	12	8	14	9	9	12	10
14.	Yellow-wattled Lapwing	3	4	0	0	4	0	0	0	2	4	2	0
15.	Bronze-winged Jacana	0	0	1	1	0	2	1	5	1	1	2	3
16.	Pheasant-tailed Jacana	1	0	0	1	0	0	1	0	0	0	0	0
17.	River Tern	3	1	11	26	2	1	6	21	2	0	7	43
18.	Black-winged Stilt	24	21	21	28	24	17	17	19	15	15	19	17
19.	Eurasian Thick-knee	0	3	2	0	0	0	0	0	1	0	0	0
20.	Grey Heron	0	0	4	4	0	1	4	5	0	2	1	5
21.	Great White Egret	1	5	1	4	1	0	7	2	2	2	7	4
22.	Intermediate Egret	4	0	10	6	11	8	22	19	6	8	11	15
23.	Little Egret	47	39	82	98	93	52	98	154	49	26	49	105
24.	Cattle Egret	65	44	75	61	48	48	62	92	40	49	44	80
25.	Indian Pond-Heron	4	10	10	8	5	10	4	6	5	7	4	9
26.	Night Heron	0	0	0	1	1	3	1	3	0	1	0	1
27.	Purple heron	1	0	2	3	2	2	3	1	1	0	0	0
28.	Eurasian spoonbill	0	0	0	0	0	0	18	12	0	0	7	11
29.	White Ibis	0	2	2	3	2	8	4	6	2	9	2	3
30.	Black-headed Ibis	0	0	0	0	0	6	6	19	0	4	7	6
31.	Red-naped Ibis	0	0	0	0	0	4	6	0	0	2	0	0

32.	Lesser Whistling-duck	7	14	27	70	23	19	62	86	25	3	28	44
33.	Ruddy Shelduck	0	0	0	0	0	2	4	8	0	0	2	4
34.	Cotton teal	5	0	0	0	19	0	0	0	16	0	0	0
35.	American Comb Duck	0	0	0	0	0	0	4	12	0	0	0	0
36.	Common Pochard	0	0	0	0	33	32	55	118	12	7	0	14
37.	Northern Pintail	0	0	0	0	4	51	54	73	0	12	7	16
38.	Common Teal	0	0	0	0	8	33	11	32	13	14	11	16
39.	Eastern Yellow Wagtail	1	3	2	12	11	3	6	13	1	7	6	10
40.	Grey wagtail	1	0	5	1	1	2	10	8	4	1	7	0
41.	White Wagtail	2	0	3	0	0	1	2	2	5	1	9	1
42.	White-browed Wagtail	1	4	3	1	3	3	3	1	2	3	4	3
43.	Ashy-crowned Sparrow-lark	2	5	2	3	0	0	0	0	0	0	0	0
44.	Pied Kingfisher	5	0	0	0	5	2	0	0	3	1	0	0
45.	White-breasted Kingfisher	2	1	1	1	1	0	0	1	0	0	1	1
46.	Common Kingfisher	1	1	2	1	0	1	1	1	0	0	0	1
47.	Indian Roller	1	2	1	2	1	3	2	2	1	4	0	1
48.	Little cormorant	20	5	33	28	30	16	32	50	44	13	18	33
49.	Great Cormorant	0	0	5	0	0	0	0	0	3	0	0	3
50.	Oriental Darter	0	0	0	0	0	1	1	1	0	0	1	0
51.	Common Coot	9	11	19	24	39	72	227	195	7	22	13	52
52.	Moorhen	0	0	0	1	1	6	4	5	1	2	0	2
53.	White-breasted Water hen	2	6	5	2	1	5	5	2	1	1	4	4
54.	Painted Stork	0	31	19	9	0	0	30	11	0	0	19	0
55.	Black Stork	0	0	0	0	0	2	9	2	0	0	2	0
56.	Asian Openbill	0	2	21	2	2	5	25	18	0	3	15	17
57.	Great Crested Grebe	0	0	0	0	2	0	0	0	2	2	0	0

Table 3. Number of Species with their Representative Families Encountered at Samoha Dam, Shivpuri (MP) India

S. No.	Name of Family	Number of Families
1.	Scolopacidae	10
2.	Charadriidae	4
3.	Jacanidae	2
4.	Laridae	1
5.	Recurvirostridae	1
6.	Burhinidae	1
7.	Ardeidae	8
8.	Threskiornithidae	4
9.	Anatidae	7
10.	Motacillidae	4
11.	Alaudidae	1
12.	Alcedinidae	3
13.	Coraciidae	1
14.	Phalacrocoracidae	2
15.	Anhingidae	1
16.	Rallidae	3
17.	Ciconiidae	3
18.	Podicipedidae	1

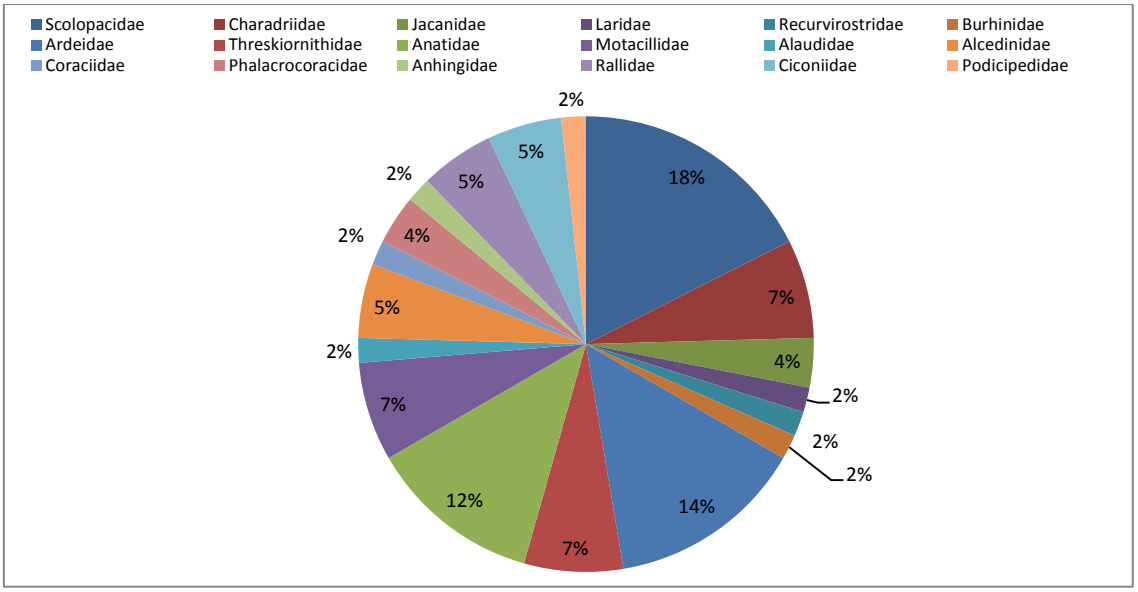

Figure 2. Showing (%) composition family wise avian species at Samoha Dam

Diversity Index of birds in different season at four different selected sites of Samoha Dam was calculated by Shannon-Wiener method. The species diversity index ranges from 0.0620 (at site 3) during summer season to 0.0974 (at site 1) in rainy season showing the diversity at different site in different season. The Avian diversity of this dam is under threat due to increased anthropogenic pressure resulting in habitat destruction and fragmentation. It is an alarming sign for conservation of the avian diversity of this dam. Direct observations and interviews with local people during survey revealed that anthropogenic pressure are the major threats to the biodiversity of the dam.

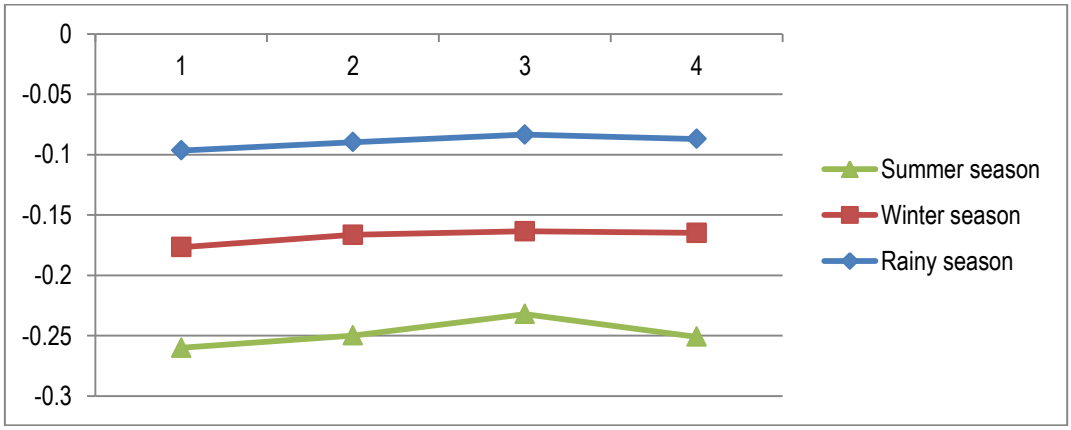

Figure 3. Shannon-Wiener Index of Bird diversity in Samoha Dam

CONCLUSION

This study reveals that the Samoha Dam is a newly growing ecosystem consist essential features for survival of birds and other wild species. Anthropogenic and agriculture process in and around the Dam affected the density and diversity of aquatic bird species. Proper awareness program regarding importance of bird and vital role in daily life have to initiate to local people and villagers.

Acknowledgements: Authors are grateful to the school of studies in Zoology, Jiwaji University for providing the necessary facilities and infrastructure and also thanks to Madhya Pradesh forest department and their supporting staff for providing valuable information.

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Sources of Support: None.
Conflict of Interest: None. Declared.