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Status of Aquatic Bird Diversity and its Conservation Issues: With Spatial Reference to the Tribal District of Rajasthan, India

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Abstract:

This paper is an attempt to identify the aquatic bird diversity with different status and highlights its conservation issues in tribal dominant district Dungarpur of Rajasthan, India. The Humid Agro-Climatic zone consist about sixteen species of global importance out of twenty three species of Rajasthan state. The avifaunal diversity consist great importance for the birders interested in the study area. Here the main objective of research paper is to depict the status of aquatic birds and analysis the favorable conditions which attract birds to keep going on. No doubt the study area holds up a great variety of avifauna but few of the aquatic bodies are under the pollution threat due to human disturbance and mixing of the sewages of rural and urban areas. Therefore, there is need to immediate attention to conserve the water bodies and preserve the aquatic habitats of the study area so that diversity of birds can be maintained.

Key words: Aquatic, Diversity, Avifaunal, Wetlands, Conservation

1 Introduction:

Rich bio-diversity of an area keeps up the quality of eco-system as well as local environment. Biodiversity refers to the variability among living organisms from all sources including

terrestrial, freshwater and marine aquatic ecosystems and the ecological complexes of which they are the part (Convention on Biological Diversity, UNEP, 1992). Earth maintains various mega eco-systems where different type of flora and fauna exists within different physical environments. As per the environmental elements and their qualities in a region it provides habitat to various species. And it maintains the interaction chain between other species. The distribution of flora and fauna on the earth surface is non-uniform due to various environmental conditions and these circumstances holds-up different eco-system conditions on terrestrial and aquatic surface.

According to Hosetti and Caplan (2001), more than 45000 species of plants and 65000 species of animals have been recorded from the Indian subcontinent representing 7 per cent and 6.5 per cent of the world's flora and fauna respectively. India's richness in avian diversity is well recognized. Of about 9000 world species in the world, around 1200 are found in India. This means about 13 per cent of the world's total, which is very remarkable for an area that is only about 4 per cent of the world's total landmass. Birds have always fascinated humankind and the reasons are quite obvious. Among all the higher forms of life called the vertebrates or back boned animals, birds are certainly the most beautiful, most melodious, most admired and most studied. Of the total of 1200 birds species found in India, about 900 are resident and rest about 300 are migratory, most of them coming from Central Asia and Eastern Europe during the winter period.

Many of these seasonal migratory birds pass through or stay put during winter in Rajasthan, which is strategically located on the flyways from the north-west. Moreover, Rajasthan has numerous water bodies that are the natural habitat of resident as well as migratory birds. Wetlands are the most productive and biologically diverse in the world but very fragile ecosystems Gibbs (1993). Wetlands and water birds are

inseparable elements and support a rich array of water bird communities Grimmett and Inskipp (2007). Activities of water birds are considered as indicator of quality of the wetland ecosystem and form the terminal links in many aquatic food chains, and as a result they reflect changes originating in several different ecosystem components Custer and Osborne (1977).

Dungarpur district in south Rajasthan is also endowed with several lakes and other water bodies along with considerable birdlife. Around 60 water bodies and wetlands sites identified in the district which holds great variety of avifauna. Every year number of resident and migratory birds are coming in this area's wetlands. But from the last few years the numbers are decreases due to some human disturbance with aquatic bodies. These need immediate attention to conservation and management of water bodies of the district.

The research study holds main objective as follows:

- To analyze the favorable conditions of habitat for resident and migratory birds.
- To depict the status of aquatic bird diversity in the District.
- To point out the major conservations issues (Aquatic habitats).
- To recommend and suggest some policy issues to conserve aquatic bird diversity in the District.

2 Material and Methodologies:

1.2.1. Study Area:

The tribal dominant District Dungarpur is a part of low-lying hills of the Aravali range, situated at the southern tip of Rajasthan. It extends between 23° 20'-24°10'N Latitude to 73°21'-74°23'E Longitude. It comprises 3770 sq. km. geographical area of the state. Rich habitat diversity of the

District is the represented by the 60 wetland sites within six forest cover range which accounts 21 per cent of its total geographical area along with its location in the upper watershed of the Mahi River and its tributaries' which is one of the two perennial rivers within the state. Gabesagar of this district is one of the prominent lake of Rajasthan. The District is categorized as IV-Humid Southern Agro-Climatic Zone with average rainfall ranging between 500-1100mm.

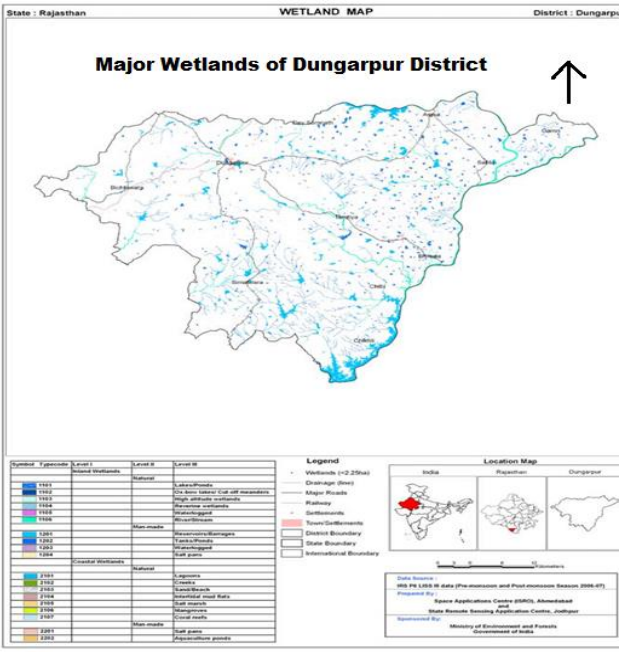


Fig. 1.1

Total 1528 wetlands are mapped including 818 small wetlands (< 2.25 ha) with 21278 ha area. Reservoirs/Barrages with 10829 ha contributed 50.89 per cent to the total wetland area. The River/Stream with 4865 ha (22.86% area) is the second major wetland category, followed by Tanks/Ponds with 4403 ha area i.e. (20.69 %). Thus, the district is dominated by man-made wetlands (National Wetland Atlas: Rajasthan, 2010). The different origin and ecological peculiarities of wetlands make up the typology of wetlands which are the main habitats of aquatic

birds. The surface water plays a major role in providing the ground to aquatic birds along with its characteristics with respect to the food availability and protection.

1.2.2. Methodology:

To achieve the proposed objectives, following Methodology was used:

To identify the avian diversity of the study area's 15 wetlands are Periodic fortnightly visits were conducted in the selected sites in the morning (06:00 to 10:00 hrs) and later in the evening (15:00 to 18:00 hrs) mostly in October to March months (in year 2012 and 2013), using line transect method (Gaston, 1975; Sales and Berkmuller, 1988) and point count method (Altman, 1974). Birds were observed within the transect of 300m. Binaculars of 10X50 were used for observations. Spot identification was done by bird expert Mr. Kamlesh Sharma (PRO Officer) and field guides. Birds were photographed and were subsequently identified using "A pocket guide of the birds of the Indian subcontinent" by Grimett *et al.* (1999) and Manakkadan and Pittie (2001). The conservation issues are also identified by field visits and observation of some suburbs wetlands.

3 Results and Discussions:

Habitats of southern Rajasthan water front are over 300 birds' species and aquatic accounts 110. Around 210 species are recorded from Vagad Region which includes about 100 aquatic species. Fascinatingly, 90 per cent of total aquatic species could be observed within suburb area of the district especially in the winter season. Thus, urban avifaunal diversity is of great importance for the birders interested. About twenty three species of global importance are recorded from the southern Rajasthan, out which sixteen species of global importance are recorded from the District.

Black-necked Stork, female on right, at a Dungarpur lake,

Basically local resident and winter migratory visitors' aquatic species of global importance are recorded from the study area. The resident aquatic species of the globally importance include Saras Crane, Storks (Painted and Black-necked), Darter, Black-Headed Ibis are found here at many wetland sites.

Whereas migratory aquatic birds of global importance includes Dalmatian Pelican, Lesser Flamingo, Ferruginous Pochard, Black-tailed Godwit, Eurasian Curlew, Black tailed Tern etc.

Sarus Crane has also found a nice home in Vaged region.

The district provides ideal climatic conditions for the Sarus Crane and as per the observation over a single year about 120 individuals were sighted in the District in late 2000s. Similarly, Ferruginous Pochard was observed distributed all over the major aquatic water bodies. Other resident aquatic species consists of commoners such as egrets, herons, cormorants, other waders, teals, ducks etc.

In the present study 85 species of aquatic birds belonging to 13 families were recorded between October to March (Fig.1.2). Anatidae was found to be the most dominant families represented by 20 species each followed by family Scolopacidae and family Arderidae represented by 17 and 8 species each. Surana (2007) recorded Anatidae to be most dominant family with 12 species and Ardeidae with 9 species in Chimdi Lake of Nepal.

Greater Flamingo at Sunset, in Sabela Pond of Dungarpur City

Kumar (2006) also recorded Ardeidae to be the most dominant family in Bhartpurzha river basin in Kerala and Kurup (1991) attributed it to the larger mudflat which attracts shorebirds in large numbers.

In the present study Ardeidae found to be the third dominant species indicating the wetlands moderately support shorebirds. Rathore and Sharma (1996) also reported Ardeidae to be dominating family with 12 species in Sarsai Nawar in Uttar Pradesh. Vijayan (1988) also reported 17 species at Anatidae in Bhartpur wetland.

Over twelve species are observed by the local birders in the heronries of the District. Further, exclusive colonies of Asian Openbills, Painted Storck (Bodigama), are eye-catching sites for the birders. The noticeable congregation of the ducks and geese are quite common throughout the District. Whereas the migratory geese (Greylag) dominate the shallow water bodies with rich vegetation, migratory pochard (Common Tufted etc.) harbor deep water sites (Kadana Dam Back Water). Over twenty-one species-of Ducks and geese could be observed in aquatic bodies of Dungarpur.

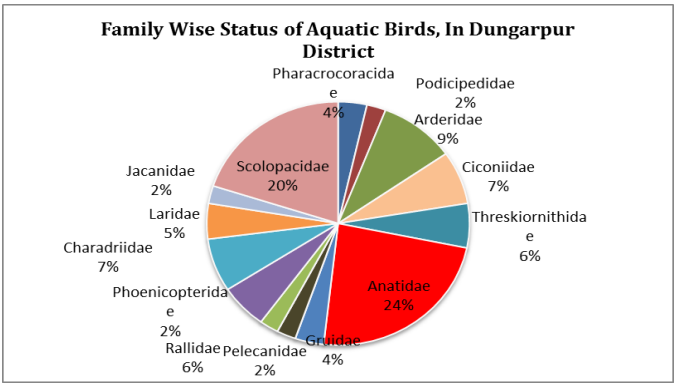
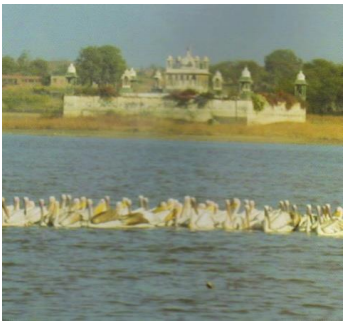


Fig 1.2 Source: Reports of Forest Department, Public Relations Office, Dungarpur(PRO)and Field Survey

Though the Demoiselle*Crane* is not so common but Common Crane could be observed in outskirt sites of human settlements.



Some global importance species categorized in IUCN Red Data List are also identified includes Dalmatian Palican, Darter, Painted Stork, Black-necked Stork, Lesser Flamingo, Ferrugionous Pochard, Egyptian Vulture, Sarus Crane, Black-bellied Tern and European Roller in the District.

The status of aquatic birds is shows according to their habitat, residential status and behavior in Appendix 1.1 at given below. Thus, the description of aquatic birds shows that the District holds great variety of avifauna. Some bird lovers also comment on the District's bird diversity that it might be a substitute of a Ganna Bird Century in future.

4 Conservation Issues:

No doubt the District consist variety of avifauna. The probable reasons might include unaltered habitats, lower level of pollution and human disturbance, lower level of human threat

as compared to other parts of southern Rajasthan. These need to be maintained for the diversity of winged residents and guests. In district aquatic bodies such: Gabesagar lake, Sabela and Suneria ponds of Dungarpur city, Gamreshwar and loharia ponds of Sagwara city and Bodigama, Patdi, Jasela and Jakola ponds of Dungarpur suburbs area are the major bodies of aquatic bird's habitat. But recently it observed that these urban and suburbs aquatic bodies are under pollution threat due to mixing of the municipal sewage as well human disturbance with aquatic birds for hunting fishing and domestic uses. The invasion of water hyacinth in few wetlands is the warning signals for the future of the aquatic bodies. Due to human disturbance in these water bodies' statistics of bird numbers are decreases year by year from 2000 (Statement by District PRO Officer). Many winter migratory birds has changed their residential habitat and some has stopped to come in the District's wetlands.

Thus, there is need to bring the concept of conserving these habitats as well as biodiversity through linking eco-centric approach. Traditional conservation practices could generate livelihood for the local community. Community based nature conservation through controlled mechanism of birding could be developed as a source of local income generation in this tribal belt. There is alos need to immediate attention and to be checked at primary level through proper management and treatment of the sewage. Further, local participation in conserving local habitats need to be encouraged through the mass awareness programs as well as creating ownership opportunities for local resident through governance, administrative setup and NGOs.

5 Conclusion:

From the above results it could be made out the availability of water, safe habitat and food sources for both common and

migratory birds around the water bodies of district's are important for the occurrence and abundance of aquatic bird populations. Around 85 species of aquatic birds belonging to 13 families were recorded in the study area which has its own importance. The resident aquatic species of the globally importance include Saras Crane, Storks (Painted and Black-necked), Darter, Black-Headed Ibis are found here at many wetland sites. Whereas migratory aquatic birds of global importance includes Dalmatian Pelican, Lesser Flamingo, Ferruginous Pochard, Black-tailed Godwit, Eurasian Curlew, Black tailed Tern etc. are indentified here in winter season spatially. Thus the proper and regular maintenance of District's water bodies would further increases the aquatic bird populations and it incessant bird lovers' interest for this region.

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Appendix: 1.1 Status of Aquatic Bird in Dungarpur District, of Rajasthan

Sr. No.	Species	Habitat			Availability Status			Residential Status
		Sw	Shw	Nca	Ab	Co	Ra	
A.	***Family: Pharacrocoracidae/Anhingide***							
1.	Little Cormorant	+				+		lcr
2.	Large Cormorant	+				+		lcr
3.	Darter	+					+	nr
B.	***Family: Podicipedidae***							
4.	Little Greebes		+			+		lcr
5.	Great Crested Greebes		+				+	nw
C.	***Family: Arderidae***							
6.	Grey Heron		+			+		lcr
7.	Large Egret or great		+			+		lcr
8.	Little Egret		+		+	+		lcr
9.	Purple Heron		+			+		lcr
10	Cattle Egret		+		+			lcr
11.	Indian Pond Heron		+		+	+		lcr
12.	Little green Heron		+				+	nr
13.	Black Crowned Night Heron		+			+		lcr
D.	***Family: Ciconiidae***							
14.	Openbill Stork	+				+		lcr
15.	Painted Stork	+					+	lcr
16	Asian Openbill Stork	+				+		lcr
17.	Black Stork	+					+	nw
18.	Wolly/white Necked	+					+	nw
19.	Black Necked Stork	+					+	nr
E.	***Family: Threskiornithidae***							
20.	Glossy Ibis		+			+		nr
21	Oriental White Ibis		+				+	nr
22.	Black Headed Ibis	+	+			+		lcr
23.	Black Ibis	+				+		lcr
24.	Eurasian Sponbill	+				+		lcr
F.	***Family: Anatidae***							
25.	Lesser Whistling Duck		+				+	nr
26.	Greylag Goose		+				+	nw
27.	Bar Headed Gosse		+			+		lcw

28.	Brahminy Shelduck		+			+		lcw
29.	Ruddy Shelduck		+			+		lcw
30.	Comb Duck	+				+		lcw
31.	Cotton Tean	+				+		lcw
32.	Gadwall	+				+		lcw
33.	Eurasian Wigeon	+				+		lcw
34.	Mallard	+					+	nr
35.	Spot Billed Duck		+			+		lcr
36.	Northen Shoveller	+			+			lcw
37.	Northen Pintail		+		+			lcw
38.	Garaney	+			+			lcw
39.	Common Teal		+					lcw
40.	Red Creasted Pochard	+	+		+			lcw
41.	Common Pochard	+	+			+		lcw
42.	Ferruginous Pochard		+				+	lcw
43.	Tufted Pochard		+				+	lcw
44.	Common Coot	+	+			+		lcr
G.	***Family : Gruidae***							
45.	Sarus Crane	+					+	lcr
46.	Common Crane	+				+		lcw
47.	Demoiselle Crane	+				+		lcw
H.	***Family: Pelecanidae***							
48.	Great White Pelicans		+				+	nw
49.	Dalmatian Pelicans		+				+	nw
I	***Family:Phoenicopteridae***							
50.	Greater Flamingo		+				+	nr
51.	Lesser Flamingo		+				+	nr
J.	***Family: Rallidae***							
52.	Brown Crake	+					+	nr
53.	White Breasted Water hen	+		+		+		lcr
54.	Purple Moorhen	+				+		lcr
55.	Common Moorhen	+		+		+		lcr
56.	Common Coot	+	+			+		lcr
J.	***Family: Charadriidae***							
57.	Greater Painted Spine			+			+	ns
58.	Little Ringed Plover	+		+		+		lcr
59.	Kentish Plover			+			+	nw
60.	Yellow Wattled Lapwing			+			+	nr
61	Red Wattled Lapwing			+		+		lcr
62	White tailed Lapwing			+		+		lcw
K.	***Family: Laridae***							
63.	Gull-billed Tern			+			+	np
64.	River Tern			+		+		lcr
65.	Black bellied Tern			+				nr
66.	Whiskered Tern			+				nw
L.	***Family: Jacanidae***							

67.	Pheasant-tailed Jacans	+				+		lcs
68.	Bronze-winged Jacana	+				+		lcs
M.	***Family: Scolopacidae***							
69.	Pintail Spine	+					+	np
70.	Common Spine	+				+		lcw
71.	Jack Spine	+						nw
72.	Black Tailed Godwit	+		+			+	lcw
73.	Eurasian Curlew			+			+	nw
74.	Spotted Redshank		+	+			+	nw
75.	Common Redshank		+	+		+		lcw
76.	Marsh Sandpiper	+		+		+		lcw
77.	Common Greenshank			+				nw
78.	Green Sandpiper	+		+			+	nw
79.	Wood Sandpiper			+				nw
80.	Common Sandpiper			+		+		nw
81.	Little Stint	+		+		+		lcw
82.	Temminck's Stint			+		+		lcw
83.	Ruff	+		+		+		lcw
84.	Black-winged Stilt	+		+		+		lcw
85.	Pied Avocet			+			+	lcw

Source: Common Reports of Forest Department, PRO and Field Survey of Dungarpur, District

Abbreviations: Habitat Status: - Sw = Swamp area with wetland, **Shw** = Shallow Water, **Nc**a= Near costal area of Pond, lacks and Rivers. **Availability Status: - Ab** = Abundant, **Co** = Common, **Ra** = Rare, **Residential Status: - lcr** = Local Common Resident, **lcw** = locally common winter visitors, **lcs** = local common summer visitors, **nw** = not common winter visitors, **nr** = not common resident, **cw** = common winter visitors, np = not common passage migrate, **ns** = not common summer visitors. (**Note: -** Residential Status of birds are defined according to the reference of the book Birds of North India, written by S.P. Mehra).