



## Comparative Study of Avifauna in Junagadh, Gujarat, India

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**Abstract:** The present study was conducted at two freshwater reservoirs of Junagadh Baliyavad Dam and Vadla Lake from July 2021 to February 2022. A total 183 species of birds were recorded belonging to 18 orders and 65 families during the study period. Family Accipitridae and Ardeidae represents the significant number of species (11 and 12 species). As per IUCN Status, one is vulnerable, two are critically endangered and five are near threatened. Out of 10 feeding guilds, insectivores are prominently dominant in both study sites. The result provided the baseline information on avifauna of Vadla Lake and Baliyavad Dam which can provide a good preliminary database and should incorporate in conservation implications.

**Keywords:** Diversity, Avifauna, Baliyavad Dam, Vadla Lake

Birds are one of the vital components of biodiversity and population very sensitive indicator of pollution in both terrestrial and aquatic ecosystem (Datta 2016). Understanding on the distribution pattern and habitat preference of bird communities over heterogeneous environment is very much essential for conservation and management of avifauna in regional as well as in local environment (Kattan and Franco 2004). Freshwater wetlands support more than 40% of all bird species and 12% of all animal species on the planet (Thapa et al 2012). Migratory birds are a vital biotic element of the wetland environment as they occupy numerous trophic tiers within side the meals net of wetland (Malik and Joshi 2013). Now-a-days, avifaunal diversity has been decreasing due to the destruction of natural habitats and human disturbances. Random destruction of natural habitats by cutting nesting trees and foraging plants for commercial use of woods and lands are the main factor responsible for narrow down in avian foraging habitat and their nesting sites (Vala and Trivedi 2018). To understand the processes of habitat selection and preference by birds is dependent on an accurate representation of the patterns of habitat occupancy. Organisms threatened by urbanization are likely to be affected for other human impacts like agriculture, recreation, roads and so on (McKenny 2005), rapid decline of some common birds has been reported with a gap of proper documentations (Rajshekhara and Venkatesha 2008, Shaw et al 2008, Khera et al 2010 ). The water dependent avifauna and their habitats are affected by various factors like food availability, hunting and poaching threats, the size of the dams (Paracuellos 2006), and the abiotic changes in the dams (Jaksic 2004, Lagos et al 2008, Vishwakarma et al

2020). There are 1341 species (26 orders, 113 families and 489 genera) are recorded from India (Praveen et al 2021) from Gujarat 612 species are recorded (Ganpule 2021).

It is very difficult to prepare any conservation plan without any baseline data (Jamam et al 2011). Thus, this study presents a checklist of birds with updated systematic, family or order wise distribution, abundance status, and enlisted base line data of avifauna. Two different habitat Baliyavad Dam and Vadla Lake has been selected for the study of diversity of avifauna and its distribution on each site. Baliyavad Dam and Vadla lake are the important bird habitat and provides suitable breeding, staging, and wintering grounds for a wide array of migratory birds.

### MATERIAL AND METHODS

**Study area:** Baliyavad Dam (21° 35'41"N and 70° 34'00"E) is the one of the largest freshwater reservoirs in Junagadh, situated 18 km away from Junagadh city (Fig. 1). The dam is filled with rainwater only once in a year during the monsoon. This site has rich plant diversity and distinct with different types of vegetative landscapes viz open scrubland, open grass land, herbaceous land, dense scrubland and trees, as well as the peripheral agro-fields, including crop rotations all over the years viz; vegetable plants, commercially important flower plants, and different grain.. Vadla Talav (21°28'55"N 70°24'15"E) (Fig. 1) is located at Vadla village, Junagadh. Approximate temperature 27.1°C and humidity 15%. This lake is one of the fresh water reservoir lake and peripheral area is surrounded by forest area. This water is used for a variety of human purposes, including fishing, animal grazing, and bathing. Because this lake is a freshwater reservoir, many water birds rely on it. These birds are staying here for the

purpose of feeding and breeding. This lake is home to Rohu, Katla, Mrigal, Silvercarp, Jodka, Dore, Mangur, and Kangsa. This lake also has zooplankton and many invertebrates, so aquatic fowl rely on it for food. Water Hyacinth's species are grow in this lake, which have completely covered the lake. As a result, this species has a greater impact on birds, as well as fish, invertebrates, and zooplanktons.

**Sampling method:** Study site was visited twice a week from July 2021 to February 2022. Surveys were conducted in the morning 8:00 to 1:00 pm and evening 4 pm to 6 pm. We collected data by using Point count, Line transects and Random transects method. The birds were observed from a safe distance to prevent the disturbance, and observations were made from the help of a Binocular Olympus (8x40), and a camera (Canon 1500d). Identification of species will be carried out with the help of standard identification key (Ali 2002, Grimmett *et. al.*, 2011, Kazmierczak 2000) and also by their calls/ songs. The birdcalls were confirmed using Xeno-

Canto bird call database (Xeno- canto 2016). The threatened status of the birds given in the checklist is as per IUCN Red List 2021 of Threatened Species (Birdlife International 2001a, b). The threatened status of birds given in the checklist is as per IUCN red list into LC-Least Concern, VU-Vulnerable, NT- Near Threatened, LC-Least Concern. A Local abundance status was assigned into as per our observation R – Rare (1- 20 sighting) C – Common (> 80-100 sighting), UC – Uncommon (21-50 sighting), FC – Fairly common (51-80sighting).

**Species richness:** This was calculated as total number of bird species observed in the study area. The relative diversity (RD<sub>i</sub>) of bird families was calculated (Torre et al 2007):

$$RD_i = \frac{\text{Number of bird species in a family}}{\text{Total number of species}} \times 100$$

### RESULTS AND DISCUSSION

During the study period total of 183 species belonging to

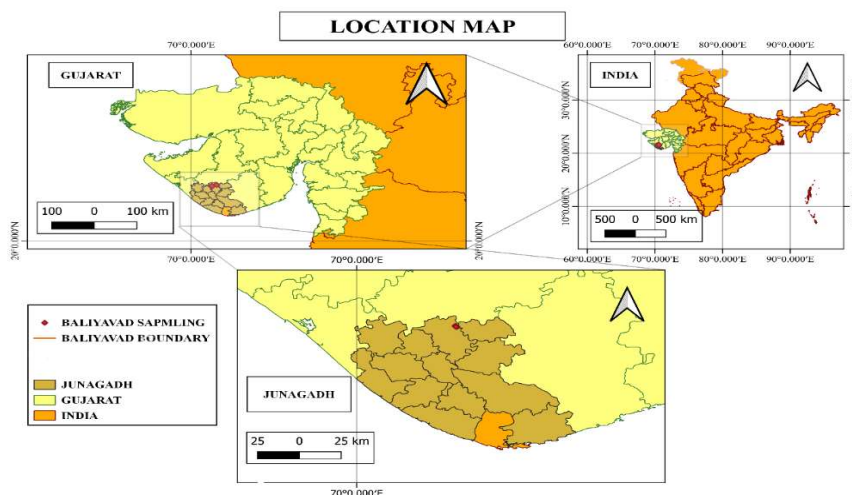


Fig. 1 A: Study area

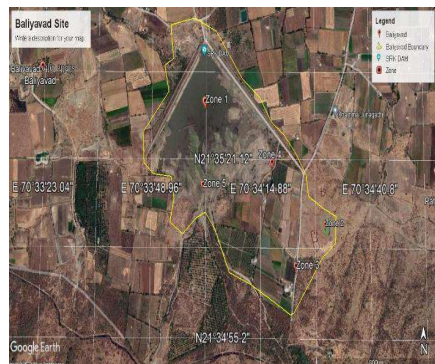


Fig. 1 B. Baliyavad Dam

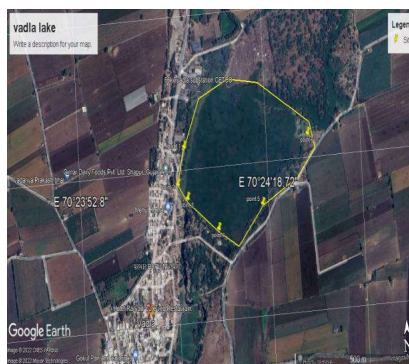


Fig. 1C. Vadla Lake

**Fig. 1.** Study area. A. location of Junagadh followed by Gujarat and India. B. site location of Baliyavad Dam and sampling location of survey. C. Site B location Vadla Lake. (Image sources: QGIS- Software 3.16, google earth pro)

**Table 1.** Bird checklist of Baliyavad Dam (Site 1) and Vadla Lake (Site 2)

Common name	Scientific name	Residential status	IUCN	Feeding guilds	Local status	WPA 1972	S1	S2
ANSERIFORMES: Anatidae								
Lesser Whistling Duck	<i>Dendrocygna javanica</i> (Horsfield 1821)	RM	LC	Omnivorous	FC	SCH IV	1	1
Ruddy Shelduck	<i>Tadorna ferruginea</i> (Pallas 1764)	WM	LC	Omnivorous	UC	SCH IV	1	0
Garganey	<i>Spatula querquedula</i> (Linnaeus 1758)	WM	LC	Omnivorous	UC	SCH IV	1	0
Northern Shoveler	<i>Spatula clypeata</i> (Linnaeus 1758)	WM	LC	Piscivorous	UC	SCH IV	1	0
Indian Spot-billed Duck	<i>Anas poecilorhyncha</i> (J. R. Forster 1781)	RM	LC	Omnivorous	UC	SCH IV	1	0
Common Teal	<i>Anas crecca</i> Linnaeus 1758	WM	LC	Herbivorous	FC	SCH IV	1	1
knob-billed duck	<i>Sarkidiornis melanotos</i> (Pennant 1769)	RM	LC	Herbivorous	FC	SCH IV	1	1
Northern Pintail	<i>Anas acuta</i> innaeus 1758	WM	LC	Herbivorous	R	SCH IV	1	0
GALLIFORMES: Phasianidae								
Indian Peafowl	<i>Pavo cristatus</i> (Linnaeus 1758)	R	LC	Omnivorous	UC	SCH IV	1	1
Common Quail	<i>Coturnix coturnix</i> (Linnaeus 1758)	R	LC	Granivorous	FC	SCH IV	1	0
Rain Quail	<i>Coturnix coromandelica</i> (J.F. Gmelin 1789)	R	LC	Granivorous	FC	SCH IV	1	0
Painted Francolin	<i>Francolinus pictus</i> (Jardine & Selby 1828)	R	LC	Granivorous	R	SCH IV	1	1
Grey Francolin	<i>Francolinus pondicerianus</i> (Gmelin 1789)	R	LC	Granivorous	UC	SCH IV	1	1
PHOENICOPTERIFORMES Podicipedidae								
Little Grebe	<i>Tachybaptus ruficollis</i> (Pallas 1764)	R	LC	Carnivorous	UC	SCH IV	1	1
COLUMBIFORMES: Columbidae								
Rock Pigeon	<i>Columba livia</i> J.F. Gmelin 1789	R	LC	Granivorous	C	SCH IV	1	1
Eurasian Collared Dove	<i>Streptopelia decaocto</i> (Frisvaldszky 1838)	R	LC	Granivorous	C	SCH IV	1	1
Spotted Dove	<i>Streptopelia chinensis</i> (Scopoli 1786)	R	LC	Granivorous	C	SCH IV	1	1
Laughing Dove	<i>Streptopelia senegalensis</i> (Linnaeus 1766)	R	LC	Granivorous	C	SCH IV	1	1
Yellow-legged Green Pigeon	<i>Treron phoenicopterus</i> (Scopoli 1786)	R	LC	Granivorous	FC	SCH IV	1	1
Oriental Turtle Dove	<i>Streptopelia orientalis</i> (Latham 1790)	WM	LC	Granivorous	UC	SCH IV	1	1
PTEROCLIFORMES: Pteroclididae								
Chestnut-bellied Sandgrouse	<i>Pterocles exustus</i> Temminck 1825	R	LC	Granivorous	C	SCH IV	1	0
CAPRIMULGIFORMES: Caprimulgidae								
Indian Nightjar	<i>Caprimulgus asiaticus</i> Latham 1790	RM	LC	Insectivorous	R	SCH IV	1	1
CAPRIMULGIFORMES: Apodidae								
Little Swift	<i>Apus affinis</i> (J.E. Gray 1830)	R	LC	Insectivorous	C	SCH IV	1	1
CUCULIFORMES: Cuculidae								
Greater Coucal	<i>Centropus sinensis</i> (Stephens 1815)	R	LC	Carnivorous	FC	SCH IV	1	1
Common Cuckoo	<i>Cuculus canorus</i> (Scopoli 1786)	RM	LC	Carnivorous	FC	SCH IV	0	1
Common Hawk Cuckoo	<i>Hierococyx varius</i> (Vahl 1797)	RM	LC	Insectivorous	UC	SCH IV	0	1
Asian Koel	<i>Eudynamys scolopaceus</i> (Linnaeus 1758)	R	LC	Omnivorous	FC	SCH IV	1	1
GRUIFORMES: Rallidae								
White-breasted Waterhen	<i>Amaurornis phoenicurus</i> (Pennant 1769)	R	LC	Insectivorous	UC	SCH IV	1	1
Purple Swampphen	<i>Porphyrio porphyrio</i> (Latham 1801)	R	LC	Insectivorous	FC	SCH IV	0	1
Ruddy-breasted Crake	<i>Zapornia fusca</i> (Linnaeus 1766)	RM	LC	Insectivorous	R	SCH IV	0	1

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**Table 1.** Bird checklist of Baliyavad Dam (Site 1) and Vadla Lake (Site 2)

Common name	Scientific name	Residential status	IUCN	Feeding guilds	Local status	WPA 1972	S1	S2
Watercock	<i>Gallixrex cinerea</i> (J.F. Gmelin 1789)	MM	LC	Insectivorous	R	SCH IV	0	1
Baillon's Crake	<i>Zapornia pusilla</i> (Pallas 1776)	WM	LC	Insectivorous	R	SCH IV	0	1
Common Moorhen	<i>Gallinula chloropus</i> (Linnaeus 1758)	RM	LC	Omnivorous	R	SCH IV	1	1
Common Coot	<i>Fulica atra</i> Linnaeus 1758	WM	LC	Omnivorous	UC	SCH IV	1	1
GRUIFORMES: Gruidae								
Common Crane	<i>Grus grus</i> (Linnaeus 1758)	WM	LC	Omnivorous	UC	SCH IV	1	0
PELECANIFORMES:Ciconiidae								
Painted Stork	<i>Mycteria leucocephala</i> (Pennant 1769)	RM	NT	Carnivorous	C	SCH IV	1	1
Woolly-necked Stork	<i>Ciconia episcopus</i> (Boddaert 1783)	RM	VU	Carnivorous	R	SCH IV	1	1
Asian Openbill	<i>Anastomus oscitans</i> (Boddaert 1783)	RM	LC	Carnivorous	UC	SCH IV	0	1
PELECANIFORMES: Pelecanidae								
Great White Pelican	<i>Pelecanus onocrotalus</i> Linnaeus 1758	WM	LC	Piscivorous	R	SCH IV	1	1
Dalmatian Pelican	<i>Pelecanus crispus</i> Bruch 1832	WM	NT	Piscivorous	R	SCH IV	1	1
PELECANIFORMES: Ardeidae								
Grey Heron	<i>Ardea cinerea</i> Linnaeus 1758	RM	LC	Piscivorous	UC	SCH IV	1	1
Yellow Bittern	<i>Ixobrychus sinensis</i> (GmelinJF 1789)	WM	LC	Piscivorous	R	SCH IV	0	1
Purple Heron	<i>Ardea purpurea</i> Linnaeus 1766	RM	LC	Piscivorous	UC	SCH IV	0	1
Indian Pond Heron	<i>Ardeola grayii</i> (Sykes 1832)	R	LC	Piscivorous	C	SCH IV	1	1
Cattle Egret	<i>Bubulcus ibis</i> (Linnaeus 1758)	R	LC	Insectivorous	C	SCH IV	1	1
Intermediate Egret	<i>Ardea intermedia</i> Wagler 1829	R	LC	Piscivorous	C	SCH IV	1	1
Great Egret	<i>Ardea alba</i> Linnaeus 1758	R	LC	Piscivorous	UC	SCH IV	1	1
Little Egret	<i>Egretta garzetta</i> (Linnaeus 1766)	R	LC	Piscivorous	C	SCH IV	1	1
Striated Heron	<i>Butorides striata</i> (Linnaeus 1758)	R	LC	Piscivorous	R	SCH IV	1	0
Black-crowned Night Heron	<i>Nycticorax nycticorax</i> (Linnaeus 1758)	RM	LC	Piscivorous	R	SCH IV	1	1
Western Reef Egret	<i>Egretta gularis</i> (Bosc 1792)	RM	LC	Piscivorous	R	SCH IV	1	0
PELECANIFORMES: Threskiornithidae								
Black-headed Ibis	<i>Threskiornis melanocephalus</i> (Latham 1790)	RM	NT	Omnivorous	UC	SCH IV	1	1
Red Naped Ibis	<i>Pseudibis papillosa</i> (Temminck 1824)	R	LC	Omnivorous	C	SCH IV	1	1
Glossy Ibis	<i>Plegadis falcinellus</i> (Linnaeus 1766)	R	LC	Molluscivorous	FC	SCH IV	1	1
Eurasian Spoonbill	<i>Platalea leucorodia</i> Linnaeus 1758	RM	LC	Piscivorous	C	SCH I	1	1
PELECANIFORMES: Phalacrocoracidae								
Little Cormorant	<i>Microcarbo niger</i> (Vieillot 1817)	RM	LC	Piscivorous	C	SCH IV	1	1
Great Cormorant	<i>Phalacrocorax carbo</i> (Linnaeus 1758)	RM	LC	Piscivorous	FC	SCH IV	1	1
PELECANIFORMES:Anhingidae								
Oriental Darter	<i>Anhinga melanogaster</i> Pennant 1769	RM	LC	Piscivorous	R	SCH IV	1	1
CHARADRIIFORMES:Burhinidae								
Great thick-knee	<i>Esacus recurvirostris</i> (Salvadori 1865)	RM	LC	Carnivorous	C	SCH IV	1	0
CHARADRIIFORMES:Recurvirostridae								
Black-winged Stilt	<i>Himantopus himantopus</i> (Linnaeus 1758)	R	LC	Carnivorous	C	SCH IV	1	1
CHARADRIIFORMES: Charadriidae								
Little Ringed Plover	<i>Charadrius dubius</i> Scopoli 1786	RM	LC	Insectivorous	R	SCH IV	1	1
Common ringed plover	<i>Charadrius hitacula</i> Linnaeus 1758	WM	LC	Small invertebrate	R	SCH IV	1	0

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**Table 1.** Bird checklist of Baliyavad Dam (Site 1) and Vadla Lake (Site 2)

Common name	Scientific name	Residential status	IUC N	Feeding guilds	Local status	WPA 1972	S1	S2
Red-wattled Lapwing	<i>Vanellus indicus</i> (Boddaert 1783)	R	LC	Insectivorous	C	SCH IV	1	1
Yellow-wattled Lapwing	<i>Vanellus malabaricus</i> (Boddaert 1783)	RM	LC	Insectivorous	R	SCH IV	1	0
CHARADRIIFORMES:Rostratulidae								
Greater Painted-snipe	<i>Rostratula benghalensis</i> (Linnaeus 1758)	R	LC	Insectivorous	R	SCH IV	1	0
CHARADRIIFORMES: Jacanidae								
Pheasant-tailed Jacana	<i>Hydrophasianus chirurgus</i> (Scopoli 1786)	RM	LC	Carnivorous	R	SCH IV	1	1
Bronze-winged Jacana	<i>Metopidius indicu</i> (Latham 1790)	RM	LC	Carnivorous	UC	SCH IV	0	1
CHARADRIIFORMES: Scolopacidae								
Little Stint	<i>Calidris minuta</i> (Leisler 1812)	RM	LC	Small invertebrate	UC	SCH IV	1	1
Common Snipe	<i>Gallinago gallinago</i> (Linnaeus 1758)	WM	LC	Piscivorous	R	SCH IV	1	1
Common Sandpiper	<i>Actitis hypoleucos</i> (Linnaeus 1758)	R	LC	Insectivorous	C	SCH IV	1	1
Wood Sandpiper	<i>Tringa glareola</i> (Linnaeus 1758)	WM	LC	Insectivorous	UC	SCH IV	1	1
Black-tailed Godwit	<i>Limosa limosa</i> (Linnaeus 1758)	WM	NT	Insectivorous	R	SCH IV	1	0
Common Redshank	<i>Tringa tetanus</i> (Linnaeus 1758)	WM	LC	Insectivorous	R	SCH IV	1	0
Green Sandpiper	<i>Tringa ochropus</i> Linnaeus 1758	WM	LC	Insectivorous	UC	SCH IV	1	1
Temminck's Stint	<i>Calidris temminckii</i> (Leisler 1812)	WM	LC	Small invertebrate	R	SCH IV	1	1
CHARADRIIFORMES: Turnicidae								
Barred Buttonquail	<i>Turnix suscitator</i> (J.F. Gmelin 1789)	R	LC	Granivorous	UC	SCH IV	1	0
Small Buttonquail	<i>Turnix sylvaticus</i> (Desfontaines 1789)	R	LC	Granivorous	UC	SCH IV	1	0
CHARADRIIFORMES:Glareolidae								
Indian Courser	<i>Cursorius coromandelicus</i> (J.F. Gmelin 1789)	RM	LC	Insectivorous	R	SCH IV	1	0
Little Pratincole	<i>Glareola lactea</i> Temminck 1820	RM	LC	Insectivorous	R	SCH IV	1	0
CHARADRIIFORMES Laridae								
Whiskered Tern	<i>Chlidonias hybrida</i> (Pallas 1811)	WM	LC	Piscivorous	FC	SCH IV	1	1
River Tern	<i>Sterna aurantia</i> Gray 1831	R	NT	Piscivorous	C	SCH IV	1	1
ACCIPITRIFORMES: Pandionidae								
Osprey	<i>Pandion haliaetus</i> (Linnaeus 1758)	WM	LC	Carnivorous	R	SCH I	1	1
ACCIPITRIFORMES: Accipitridae								
Black-winged Kite	<i>Elanus caeruleus</i> (Desfontaines 1789)	R	LC	Carnivorous	R	SCH IV	1	1
Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i> (Temminck 1821)	R	LC	Carnivorous	R	SCH IV	1	1
Booted Eagle	<i>Hieraaetus pennatus</i> (J.F. Gmelin 1788)	WM	LC	Carnivorous	R	SCH IV	1	1
Shikra	<i>Accipiter badius</i> (J.F. Gmelin 1788)	R	LC	Carnivorous	R	SCH IV	1	1
Black Kite	<i>Milvus migrans</i> Boddaert 1783)	R	LC	Carnivorous	UC	SCH IV	1	1
Short-toed Eagle	<i>Circaetus gallicus</i> (J.F. Gmelin 1788)	R	LC	Carnivorous	R	SCH IV	1	0
Western Marsh Harrier	<i>Circus aeruginosus</i> (Linnaeus 1758)	WM	LC	Carnivorous	R	SCH IV	0	1
Indian Vulture	<i>Gyps indicus</i> (Scopoli 1786)	RM	CR	Carnivorous	R	SCH I	1	0
Red headed vulture	<i>Sarcogyps calvus</i> (Scopoli 1786)	RM	CR	Carnivorous	R	SCH IV	1	0
White-eyed Buzzard	<i>Butastur teesa</i> (Franklin 1831)	R	LC	Carnivorous	UC	SCH IV	0	1
Eurasian Sparrowhawk	<i>Accipiter nisus</i> (Linnaeus 1758)	WM	LC	Carnivorous	R	SCH IV	0	1
Black Eagle	<i>Ictinaetus malaiensis</i> Temminck 1822	RM	LC	Carnivorous	R	SCH IV	1	0
BUCEROTIFORMES : Upupidae								
Common Hoopoe	<i>Upupa epops</i> Linnaeus 1758	R	LC	Insectivorous	R	SCH IV	1	1
CORACIIFORMES: Meropidae								
Green Bee-eater	<i>Merops orientalis</i> Latham 1801	R	LC	Insectivorous	C	SCH IV	1	1

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**Table 1.** Bird checklist of Baliyavad Dam (Site 1) and Vadla Lake (Site 2)

Common name	Scientific name	Residential status	IUCN	Feeding guilds	Local status	WPA 1972	S1	S2
CORACIIFORMES: Coraciidae								
European Roller	<i>Coracias garrulus</i> Linnaeus 1758	MM	LC	Insectivorous	R	SCH IV	1	0
Indian Roller	<i>Coracias benghalensis</i> (Linnaeus 1758)	RM	LC	Insectivorous	R	SCH IV	1	1
CORACIIFORMES: Alcedinidae								
Common Kingfisher	<i>Alcedo atthis</i> (Linnaeus 1758)	R	LC	Piscivorous	UC	SCH IV	1	1
Pied Kingfisher	<i>Ceryle rudis</i> (Linnaeus 1758)	R	LC	Piscivorous	UC	SCH IV	1	1
White-throated Kingfisher	<i>Halcyon smyrnensis</i> (Linnaeus 1758)	R	LC	Piscivorous	C	SCH IV	1	1
PSITTACIIFORMES: Psittaculidae								
Rose-ringed Parakeet	<i>Psittacula kramera</i> (Scopoli 1769)	R	LC	Frugivorous	C	SCH IV	1	1
Plum-headed Parakeet	<i>Psittacula cyanocephala</i> (Linnaeus 1766)	RM	LC	Frugivorous	UC	SCH IV	0	1
PASSERIFORMES: Pittidae								
Indian Pitta	<i>Pitta brachyura</i> (Linnaeus 1766)	MM	LC	Insectivorous	R	SCH IV	1	0
PASSERIFORMES: Aegithinidae								
Common Iora	<i>Aegithina tiphia</i> (Linnaeus 1758)	R	LC	Insectivorous	UC	SCH IV	1	1
Marshall's Iora	<i>Aegithina nigrolutea</i> (G.F.L. Marshall 1876)	R	LC	Insectivorous	C	SCH IV	0	1
PASSERIFORMES: Dicuridae								
Black Drongo	<i>Dicurus macrocercus</i> Vieillot 1817	R	LC	Insectivorous	FC	SCH IV	1	1
Ashy Drongo	<i>Dicurus leucophaeus</i> Vieillot 1817	RM	LC	Insectivorous	UC	SCH IV	1	1
PASSERIFORMES: Rhipiduridae								
White-browed Fantail	<i>Rhipidura aureola</i> Lesson 1831	R	LC	Insectivorous	FC	SCH IV	1	0
White-spotted Fantail	<i>Rhipidura albicollis</i> (Vieillot 1818)	R	LC	Insectivorous	UC	SCH IV	1	1
PASSERIFORMES: Laniidae								
Bay-backed Shrike	<i>Lanius vittatus</i> (Valenciennes 1826)	R	LC	Insectivorous	UC	SCH IV	1	0
Brown Shrike	<i>Lanius cristatus</i> Linnaeus 1758	WM	LC	Insectivorous	R	SCH IV	1	0
Long-tailed Shrike	<i>Lanius schach</i> Linnaeus 1758	R	LC	Insectivorous	UC	SCH IV	1	1
PASSERIFORMES: Monarchidae								
Black-naped Monarch	<i>Hypothymis azurea</i> (Boddaert 1783)	WM	LC	Insectivorous	R	SCH IV	1	0
Indian Paradise-flycatcher	<i>Terpsiphone paradisi</i> (Linnaeus 1758)	RM	LC	Insectivorous	R	SCH IV	1	1
PASSERIFORMES: Campephagidae								
Small Minivet	<i>Pericrocotus cinnamomeus</i> (Linnaeus 1766)	RM	LC	Insectivorous	R	SCH IV	0	1
PASSERIFORMES: Nectariniidae								
Purple Sunbird	<i>Cinnyris asiaticus</i> (Latham 1790)	R	LC	Nectarivorous	C	SCH IV	1	1
PASSERIFORMES: Ploceidae								
Baya Weaver	<i>Ploceus philippinus</i> (Linnaeus 1766)	R	LC	Granivorous	C	SCH IV	1	1
PASSERIFORMES: Sturnidae								
Rosy Starling	<i>Pastor roseus</i> Linnaeus 1758	WM	LC	Insectivorous	C	SCH IV	1	1
Brahminy Starling	<i>Sturnia pagodarum</i> (Gmelin 1789)	R	LC	Omnivorous	UC	SCH IV	1	1
Common Myna	<i>Acridotheres tristis</i> (Linnaeus 1766)	R	LC	Omnivorous	C	SCH IV	1	1
Bank Myna	<i>Acridotheres ginginianus</i> (Latham 1790)	R	LC	Omnivorous	C	SCH IV	1	1
PASSERIFORMES: Muscicapidae								
Indian Robin	<i>Saxicoloides fulicatus</i> (Linnaeus 1766)	R	LC	Insectivorous	C	SCH IV	1	1
Oriental Magpie Robin	<i>Copsychus saularis</i> (Linnaeus 1758)	R	LC	Insectivorous	C	SCH IV	1	1
Common Stonechat	<i>Saxicola rubicola</i> (Linnaeus 1766)	WM	LC	Insectivorous	C	SCH IV	1	1

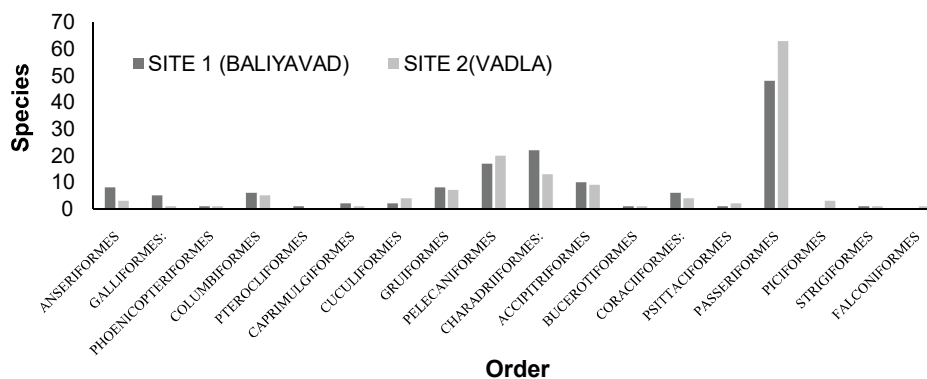
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**Table 1.** Bird checklist of Baliyavad Dam (Site 1) and Vadla Lake (Site 2)

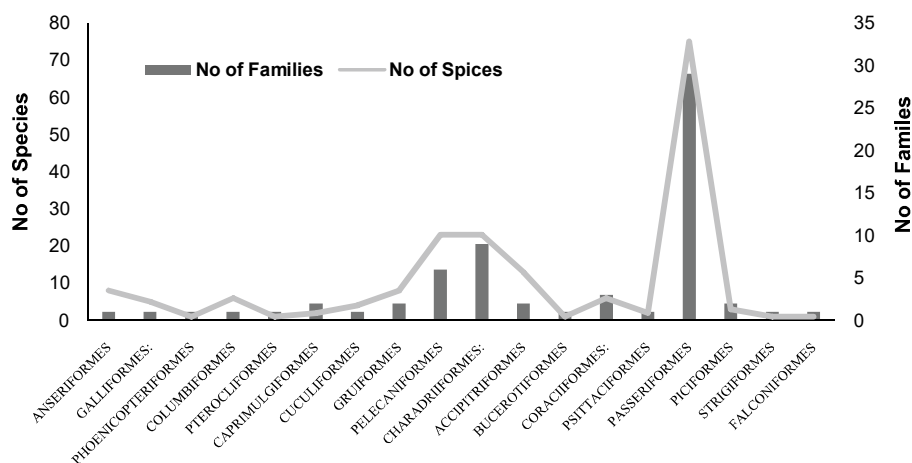
Common name	Scientific name	Residential status	IUCN	Feeding guilds	Local status	WPA 1972	S1	S2
Black Redstart	<i>Phoenicurus ochruros</i> (Gmelin 1774)	WM	LC	Insectivorous	R	SCH IV	1	1
Spotted Flycatcher	<i>Muscicapa striata</i> (Pallas 1764)	WM	LC	Insectivorous	R	SCH IV	0	1
Asian Brown Flycatcher	<i>Muscicapa dauurica</i> Pallas 1811	WM	LC	Insectivorous	R	SCH IV	0	1
Bluethroat	<i>Luscinia svecica</i> (Linnaeus 1758)	WM	LC	Insectivorous	R	SCH IV	0	1
Blue-capped Rock Thrush	<i>Monticola cinclorhyncha</i> (Vigors 1831)	WM	LC	Insectivorous	R	SCH IV	0	1
Tickell's Blue Flycatcher	<i>Cyornis tickelliae</i> Blyth 1843	RM	LC	Insectivorous	R	SCH IV	1	1
Brown-breasted Flycatcher	<i>Muscicapa muttu</i> (E.L. Layard 1854)	WM	LC	Insectivorous	R	SCH IV	1	1
PASSERIFORMES: Acrocephalidae								
sykes's Warbler	<i>Iduna ram</i> (Sykes 1832)	WM	LC	Insectivorous	R	SCH IV	1	1
Booted Warbler	<i>Duna caligat</i> (M.H.C. Lichtenstein 1823)	WM	LC	Insectivorous	R	SCH IV	0	1
Clamorous Reed Warbler	<i>Acrocephalus stentoreu</i> (Hemprich & Ehrenberg 1833)	WM	LC	Insectivorous	R	SCH IV	0	1
Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i> Blyth 1849	WM	LC	Insectivorous	R	SCH IV	0	1
PASSERIFORMES: Dicaeidae								
Thick-billed Flowerpecker	<i>Dicaeum agile</i> (Tickell 1833)	R	LC	Nectarivorous	FC	SCH IV	0	1
PASSERIFORMES: Corvida								
Rufous Treepie	<i>Dendrocitta vagabunda</i> (Latham 1790)	RM	LC	Omnivorous	C	SCH IV	0	1
Large-billed Crow	<i>Corvus macrorhynchos</i> Wagler 1827	RM	LC	Omnivorous	FC	SCH IV	0	1
House Crow	<i>Corvus splendens</i> Vieillot 1817	R	LC	Omnivorous	C	SCH IV	0	1
PASSERIFORMES: Fringillidae								
Common Rosefinch	<i>Erythrura erythrura</i> (Pallas 1770)	WM	LC	Frugivorous	R	SCH IV	0	1
PASSERIFORMES: Paridae								
Cinereous Tit	<i>Parus cinereus</i> Vieillot 1818	RM	LC	Insectivorous	UC	SCH IV	0	1
PASSERIFORMES: Phylloscopidae								
Common Chiffchaff	<i>Phylloscopus collybita</i> (Vieillot 1817)	WM	LC	Insectivorous	UC	SCH IV	0	1
PASSERIFORMES: Zosteropida								
Oriental White-eye	<i>Zosterops palpebrosus</i> (Temminck 1824)	RM	LC	Insectivorous	FC	SCH IV	0	1
PASSERIFORMES: Timaliidae								
Tawny-bellied Babbler	<i>Dumetia hyperythra</i> (Franklin 1831)	RM	LC	Insectivorous	UC	SCH IV	0	1
PASSERIFORMES: Turdidae								
Orange-headed Thrush	<i>Geokichla citrina</i> (Latham 1790)	WM	LC	Insectivorous	R	SCH IV	0	1
PICIFORMES: Ramphastidae								
Coppersmith Barbet	<i>Psilopogon haemacephalus</i> (Statius Muller 1776)	R	LC	Frugivorous	UC	SCH IV	0	1
PICIFORMES: Picidae								
Northern Wryneck	<i>Jynx torquilla</i> Linnaeus 1758	WM	LC	Insectivorous	R	SCH IV	0	1
Yellow-crowned Woodpecker	<i>Dendrocopos mahrattensis</i> (Latham 1801)	R	LC	Insectivorous	FC	SCH IV	0	1
STRIGIFORMES: Strigidae								
Jungle Owlet	<i>Glaucidium radiatum</i> (Temminck 1821)	R	LC	Insectivorous	FC	SCH IV	0	1
FALCONIFORMES: Falconidae								
Peregrine Falcon	<i>Falco peregrinus</i> Tunstall 1771	WM	LC	Insectivorous	R	SCH IV	0	1

**Table 2.** Relative diversity index (RDi) of recorded avifauna families in Baliyavad

No	Families	Number of species recorded	RDi
A1	Podicipedidae, Pteroclididae, Caprimulgidae, Apodidae, Gruidae, Anhingidae, Burhinidae, Recurvirostridae, Rostratulidae, Pandionidae, Upupidae, Meropidae, Pittidae, Aegithinidae, Nectariniidae, Ploceidae, Estrildidae, Emberizidae, Pycnonotidae, Campephagida, Dicaeidae, Fringillidae, Paridae, Phylloscopidae, Zosteropida, Timaliidae, Ramphastidae, Strigidae, Falconidae, Turdidae,	1	0.54
A2	Cuculidae, Ciconiidae, Pelecanidae, Phalacrocoracidae, Laridae, Coraciidae, Psittaculidae, Dicruridae, Rhipiduridae, Monarchidae, Passeridae, Turnicidae, Glareolidae, Jacanidae, Picida	2	1.09
A3	Leiothrichidae, Laniidae, Alcedinidae, Ciconiidae, Corvida	3	1.64
A4	Threskiornithidae, Charadriidae, Acrocephalidae, Sturnidae, Cuculidae, Hirundinidae	4	2.19
A5	Motacillidae, Phasianidae, Cisticolidae	5	2.73
A6	Columbidae, Alaudidae	6	3.28
A7	Rallidae, Monarchidae	7	3.83
A8	Anatidae	8	4.37
A9	Muscicapidae	10	5.46
A10	Ardeidae	11	6.01
A11	Accipitridae	12	6.56



**Fig. 2.** Comparative account of species at site 1 and site 2. Comparative species level representation of Avifauna at Site 1 and Site 2



**Fig. 3.** Order and family representation of avifauna from the Site 1 and Site 2



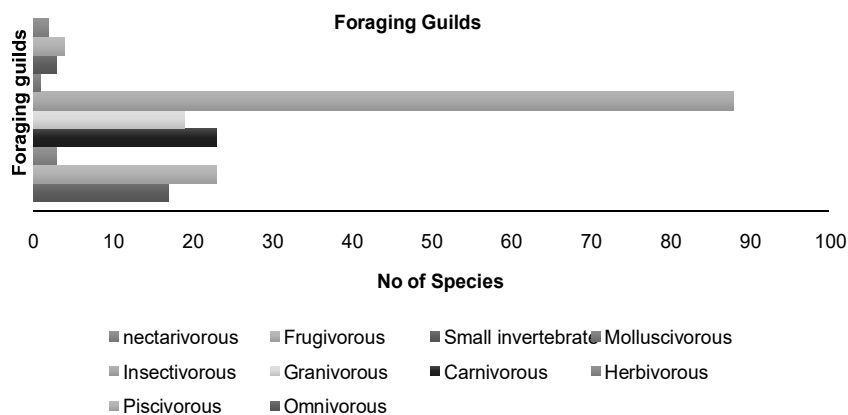


Fig. 4. Representation of Foraging Guilds of avifauna from the study Site 1 and Site 2

65 families, 18 orders has been recorded. Total 16347 individuals were recorded in the study area during the study period. Passeriformes (48 species) has highest number of species followed by Phoenicopteriformes, Pteroclitiformes, Bucerotiformes, Strigiformes and Falconiformes (1 species each). The family Accipitridae and Ardeidae was most diverse among all the 65 families, with a species richness of 12-11 species, the second largest family was Anatidae. Moreover, there were 30 families which were represented with single species (Table 1, Fig. 1 to 4).

The foraging guilds was divided into 10 guilds, out of 10 feeding guilds 88 were insectivorous, 23 Piscivorous, 23 carnivorous, 19 Granivorous, 2 Nectarivorous, 17 was omnivorous, 3 were small invertebrates eaters, 2 Frugivorous, 2 were and 1 were Molluscivorous. Eight species are fall under the IUCN categories. One is Vulnerable, two are Critically Endangered and five are Near Threatened. Out of the total 183 recorded avian species, 55.22% were Resident, 21.64% were Resident Migrants, 3(1.49%) were Monsoon Migrants & 48 (21.64%) were Winter Migrants. In the present study, a local status to each recorded bird species according to their encounter in the field revealed that 51 species were common, 20 species were fairly common, 45 species were uncommon, and 67 species were rare. Accipitridae and Ardeidae was the most diverse bird family in the study area (12 species,  $RDi = 6.55$ ) followed by Ardeidae) Anatidae and Rallidae, Monarchidae, Columbidae, Alaudidae (6 species,  $RDi = 3.27$ ), Motacillidae, Phasianidae, Cisticolidae (5 species,  $RDi = 2.73$ ), Threskiornithidae, Charadriidae, Acrocephalidae, Sturnidae, Cuculidae, Hirundinidae (4 species,  $RDi = 2.18$ ), Leiothrichidae, Laniidae, Alcedinidae, Ciconiidae, Corvida (3 species,  $RDi = 1.63$ ), Cuculidae, Ciconiidae, Pelecanidae, Phalacrocoracidae, Laridae, Coraciidae, Psittaculidae, Dicuridae, Rhipiduridae, Monarchidae, Passeridae,

Turnicidae, Glareolidae, Jacanidae, Picidae (2 species,  $RDi = 1.09$ ), while 30 families were poorly represented in the study area with a single species in each ( $RDi = 0.54$ ; Table 2). Baliyavad Dam and Vadla lake are quite rich in bird diversity including a good number of winter visitors. No systematic checklists are available for the Junagadh. This data will give detailed account of avifaunal diversity which will help in management of anthropogenic activities at the study areas.

## CONCLUSION

During the entire study period recorded to 138 species of birds belonging to 14 orders and 51 families during the study period. Both habitats are suitable for the avifauna. This happened due to heterogeneity and rich amount of shelter and food available to migratory birds. Good number of migrant species in December and January. Since no significant records of diversity are available on the both the sites, this data will be useful for the further conservation plans of avifauna at Baliyavad Dam and and Vadla lake.

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