International Journal of Fauna and Biological Studies
Available online at www.faunajournal.com

E-ISSN 2347-2677
P-ISSN 2394-0522
www.faunajournal.com
IJFBS 2022; 9(1): 37-44
Received: 08-11-2021
Accepted: 23-12-2021

CP Singh
Department of Zoology, Wild life and Environmental Research Lab, Janta Mahavidyalaya, Ajitmal, Auraiya, Utter Pradesh India

Dr. Yogesh Babu Dixit
Department of Zoology, Wild life and Environmental Research Lab, Janta Mahavidyalaya, Ajitmal, Auraiya, Utter Pradesh India

Corresponding Author:
CP Singh
Department of Zoology, Wild life and Environmental Research Lab, Janta Mahavidyalaya, Ajitmal, Auraiya, Utter Pradesh India

Avian biodiversity in Bharthana and Chakar Nagar Tahseel of district Etawah U.P. India

CP Singh and Dr. Yogesh Babu Dixit

DOI: https://doi.org/10.22271/23940522.2022.v9.i1a.878

Abstract
There were seven surveys conducted for the purpose of identification of avian diversity in Bharthana and Chakar Nager Tahseel of District Etawah in U.P. These ornithological surveys were carried out of three years from March 2017 to March 2021 for assessing the distribution, status, abundance of local, resident, migratory bird species in study area. Covering area is about 225 km2. In these surveys there were a total bird species 85 recorded and belonging to 72 genera, 37 families and over 15 orders were noticed, out of these 85 bird species diversity shows that 69.41% resident, 24.70% local migrant, 1.17% migrant, 4.70% summer visitors were distributed. No winter visitor species was observed. The habitat preference is wetland, terrestrial, terrestrial forest terrestrial aerial and terrestrial riverine. According to IUCN red list category shows that NT, VU, EN, LC and T were recorded in surrounding target area of study. The abundance 62.52% common, 28.25% un common and 8.25% rare bird species were found.

Keywords: Local water bodies, Resident birds, local migrant, winter visitors, summer visitors and IUCN

Introduction
Birds are flying vertebrates they comprises 13% of total birds species in Indian subcontinent in world the presence of more than 9000 Bird Species Girmett *et al*. 1988 [1]. The habitat of birds is divided in to four categories that are forests, wetland, shrubs and riverine area but some species are found in both terrestrial and aquatic habitat, they have fantastic ability to move and most species are found in particular habitats. The living species of birds are grouped in to 27 Order and 155 families. Any environmental or biotic pressure or anthropogenic disturbance altering the habitat and distribution of plant community may seriously affected the bird's diversity. The species richness depend on availability of food, water bodies, plant community and less anthropogenic activities and absence of predators. These facilities makes easy and safe in feeding, moving, breeding and in parental caring. According to food birds are omnivorous, frugivorous, insectivorous, grain eater, carnivorous, sap feeder and herbivorous. The richness of species is mainly due to presence of adequate food supply, water quality and plant community and without any biotic disturbances. Bharthna tahseel (26.7523 N 79.2218 E) is located near NH2 in south direction from 8 Km away from Bakewar kaswa (26.6617N,79.1746E), and 37 km away from district head quarter of Etawah district (26.7900N,79.0300E) and Chakar Nagar tahseel (26.5741 N,79.0956 E) is located in National Chambal Sanctuary area away from district head quarter about 36.7 km. In the presence of a large number of water bodies and plant communities. Bharthana and Chakar Nager area is an ideal habitat of all kind of birds including local and migratory birds. Migratory birds visited in months of last November to April. The water bodies used to support water migratory aquatic as well as terrestrial bids population. There is no comprehensive data available till now for avian fauna in this area. So we decided to carry out a detailed study.

Survey method and identification
The entire study area was surveyed by motorcycle some time by car or on foot for observing birds population and habitat information. Data sheets were used to record all related aspects of avifauna such as habitat type, location, feeding habit, their number, activity and occurring time. Observations were carried out at regular intervals during the time of each months at weekly or sometimes fortnightly. The observations were made a period of three years from March 2017 to march 2021.A binocular (10x50) used for visual aids. Photographic evidences were taken by sonny camera (16 x mega pixel) or some times by Redmi Note 8 Mobile camera also used. Linear and branching surveys methods also have done [7].

Bird survey was conducted, when birds are most active during day from 07:00 to 11:00hrs and from 16:00 to 19:00 hrs. Field visits have been conducted weekly twice in the entire habitat. Identification manuals and field guides [8, 9, 17] were used during survey. A common, scientific name, Classification and Nomenclature of the birds following [10-13] was adopted. The birds were categorized as Resident (R) and Migratory (M); Aquatic (A) and Terrestrial (T) [11]. All the birds species recorded during the present study were tabulated giving their scientific name, family, IUCN status & W (P) A legal status. The following formula was used for calculating the percentage of familes orders and other aspects

$$\text{Percentage of occurrence} = \frac{\text{No of each species of order/family}}{\text{Total no of different species}} \times 100$$

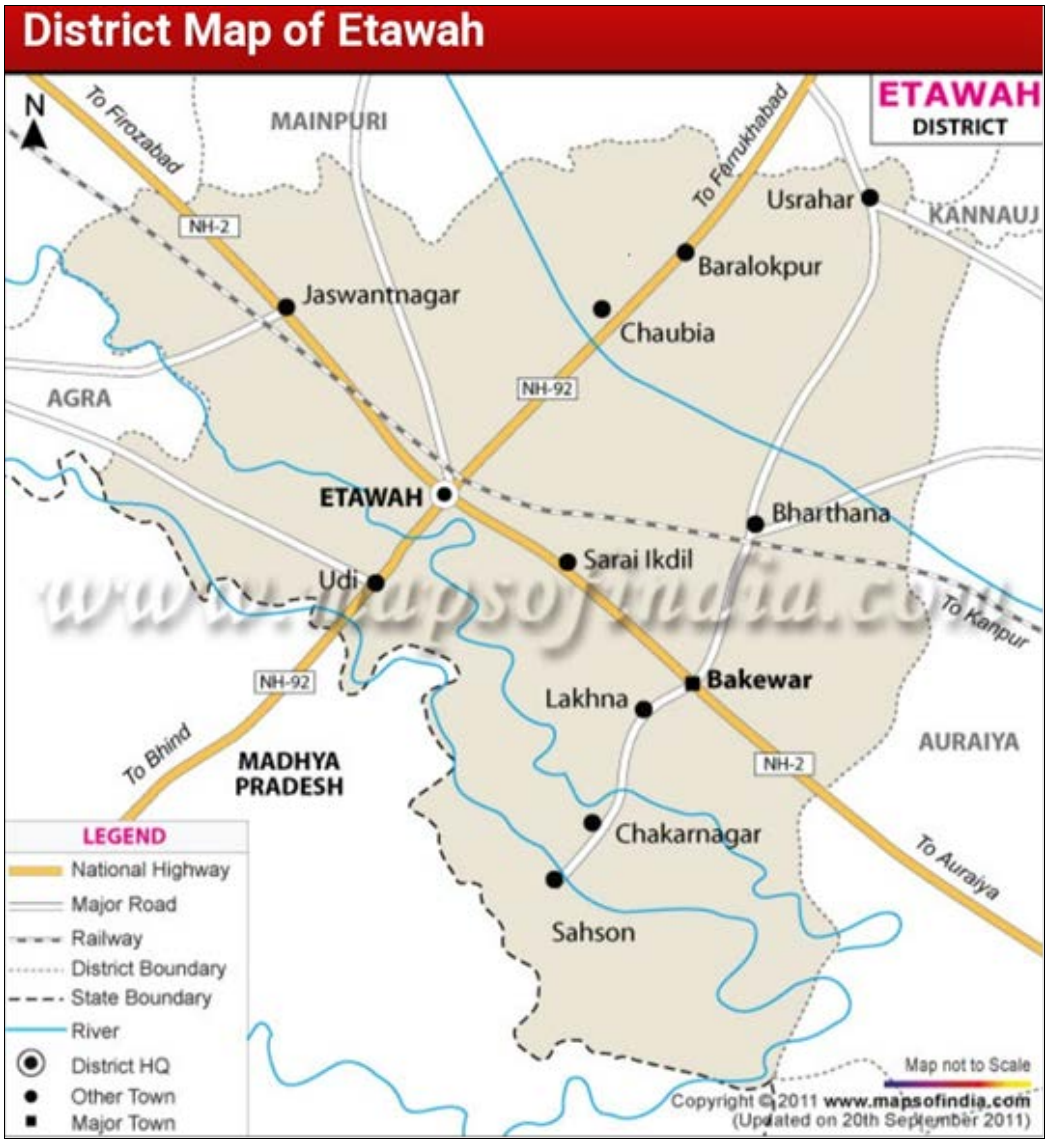


Fig 1: Map of Etawah

Results and discussion

Bharthana and Chakar nagar tahseel are located near north side of Chambal Sanctuary in District Etawah. The bird survey were conducted three consequent years from march 2017 to march 2021, a total 85 bird species belonging to 72 genera, 37 families and over 15 orders were recorded (Table - 1). The percentage composition of families and genus under different orders are shown in Table 3 and Fig 1. Among the 15 orders of birds recorded, order Passeriformes is dominant with 11 families contributing 29.72% of the total species and 14 genus contributing 19.44% followed by Charadriiformes with 05 families (13.51%),and 09 genus (12.5%), Cuculiformes with 03 families (8.10%) and 08 genus (11.11%), Collumbiformes, CoraciIformes Falconiformes Suliformes Bucerotiformes Pelecaniformes 02 families each (5.40%) and lowest families Galliformes, Gruiformes, Ciconiiformes, Apodiformes, Strigiformes, Psittaciformes each with 01 family (2.70%) percentage of genus of CoraciIformes and Cuculiformes 08 (11.11%),07 (9.72%) Falconiformes, 04 (5.55%) Galliformes, Gruiformes Suliformes.03 (4.16%) Ciconiiformes, Pelecaniformes, 02 (2.77%) Collumbiformes Strigiformes, Bucerotiformes, lowest genus 01 (1.38%) Psittaciformes Apodiformes, of the total 37 recorded families the percentage of the species are Ardeidae and Accipitridae contributed highest with 08(9.41%) followed by Phasianidae and Clummbidae 05 (5.88%), Cuculidae, Scolopacidae, Sturnidae, Ciconiidae 04 (4.70%), 03(3.52%), Alcedinidae, charadriidae, 02(2.35%) Threskiornithidae Meropidae, Phalacrocoracidae corvidae Dicruridae, Strigidae, Leiothrichidae, Laridae, Ralidae,

Gruidae, Coracidae, Pandionidae, Pelecanidae, Anhingidae, Burhinidae, Apodidae, Cisticolidae, Ploceidae, zosteropidae, Muscicapidae, Pycnonotidae, Motacillidae, Passeridae, Upupidae, Bucerotidae, Psittaculidae each with 01 (1.17%). The habitat preference is 38.82% wet land, 30.58% terrestrial, 21.17% terrestrial forest.4.70% terrestrial riverine and terrestrial aerial and 69.41% resident,24.70% local migrant, 4.70% summer visitor, 1.17% migrant species were recorded. The IUCN red list 2021 shows 77.64% least concern, 8.23% threatened, 5.88% vulnerable and near threatened and 2.43% endangered. The abundance is 62.52% common, 28.25% un common and 8.25% rare species were observed. Main threats in the habitation are deforestation, use of chemical fertilizers pesticides insecticides and herbicides in agricultural fields, water lifting from water bodies poaching fishing were also noticed and polythene and sewage shown in table: 5.

Fig 1, 2: Bird flock feeding in water body of Gadauna Phoolpur canal Bridge Auraiya

Fig 3: Dr Y. B, Dixit bird watching water body of Ajitmal Near J. M. V. Auraiya

Fig 4: Chambal survey for Bird Exploration by C P Singh with collaboration of Etawah UPFD

Table 1: List of Avian fauna their abundance, Categories habitat and Distribution

S.No	Local name	Zoological name	Order	Family	Habitat	Category	Observed no	IUCN Red list category	Abundance
1	Indian peafowl	Pavo cristatus	Galliformes	Phasianidae	T	R	200	LC	Com
2	Jungle Bush Quail	Perdicula asiatica			T	R	300	LC	com
3	Grey francolin	Francolinus pondicerianus			T/F	R	10000	LC	
4	Common quail	Coturnix coturnix			T/F	R	15000	LC	Com
5	Rock bush quail	Perdicula argoondah			T/F	R	300	LC	Com
6	Rock pigeon	Columba livia	Collumbiforms	Columbidae	T/F	R	550	LC	Un com
7	Spotted dove	Spilopelia chinensis			T	R	200	LC	Un com
8	Laughing dove	Spilopelia senegalensis			T	R	450	LC	Com
9	Eurasian collared dove	Streptopelia decaocto			T	R	300	LC	Com
10	Yellow footed green pigeon	Treron phoenicopterus			T /AE	R	100	LC	Un com
11	Green bee eater	Merops orientalis	Coraciiformes	Meropidae	T/F	R	600	LC	Com
12	Blue tailed bee eater	Merops philippinus			T/F	R	500	LC	Com
13	Indian roller	Coracias benghalensis		Coracidae	T	R	40	LC	Un com
14	Indian cuckoo	Eudynamy scolopaceus	Cuculiformes	Cuculidae	T/AE	SV	300	LC	Com
15	Drongo cuckoo	Surniculus lugubris			T /AE	SV	20	LC	Un com
16	Greater coucal	Centropus sinensis			T/F	R	150	LC	Com
17	Lesser coucal	Centropus bengalensis			T/F	R	203	LC	Com
18	Osprey	Pandion haliaetus	Falconiformes	Pandionidae	T/RI	R	10	LC	Un com
19	Black shouldered kite	Elanus axillaris		Accipitridae	T	R	23	LC	Un com
20	Black kite	Milvus migrans			T	R	40	LC	Un com
21	Grey headed fish eagle	Ichthyophaga ichthyaetus			T/RI	R	15	NT	Un com
22	Egyptian vulture	Neophron percnopterus			T/RI	R	400	EN	Com
23	Black eagle	Ictinaetus malaiensis			T/RI	R	63	VU	Un com
24	Shikra	Accipiter badius			T		201	LC	com
25	Besra	A.virgatus			T	R	32	LC	Un com
26	Long legged buzzared	Buteo rufinus			T	R/LM	23	T	Un com
27	Little egret	Egretta garzetta	Pelecaniformes	Ardeidae	WL	R/LM	2000	LC	Com
28	Median egret	Ardea intermedia			WL	R/LM	300	LC	Com
29	Large egret	Ardea alba			WL	R/LM	1500	LC	Com
30	Cattle egret	Bubulcus ibis			WL	R/LM	2500	LC	Com
31	Indian pond heron	Ardeola grayii			WL	R/LM	700	LC	Com
32	Night heron	Nycticorax nycticorax			WL	R/LM	35	LC	Un com
33	Grey heron	Ardea cinerea			WL	R/LM	300	LC	Com
34	Purple heron	Ardea pupurea			WL	R/LM	45	LC	Un com
35	Great white pelican	Pelecanus onocrotalus		Pelecanidae	WL	M	10	LC	R
36	Black ibis	Pseudibis papillosa		Threskionithidae	WL	R/LM	800	NT	Com
37	Black headed ibis	Threskiornis melanocephalus			WL	R/LM	650	NT	Com
38	White necked stork	Ciconia episcopus	Ciconiiformes	Ciconiidae	WL	R/LM	1600	VU	Com
39	Black necked stork	Ephippoiorhynchus asiaticus			WL	R/LM	8	T	R
40	Painted stork	Mycteria leucocephala			WL	R/LM	1900	T	Com
41	Asian Open bill stork	Anastomus oscitans			WL	R/LM	200	LC	Com
42	Common king fisher	Alcedo atthis		Alcedinidae	WL	R	230	LC	Com
43	White throated king fisher	Halcyon smyrnensis			WL	R/LM	400	NT	Com
44	Pied kingfisher	Ceryie rudis			WL	R/LM	50	LC	Un com
45	Little cormorant	Microcarbo niger	Suliformes	Phalacrocorcidae	WL	R/LM	2400	LC	Com
46	Great cormorant	Phlacrocorax carbo			WL	R/LM	300	LC	Un com
47	Darter	Anhinga anhinga		Anhingidae	WL	R/LM	145	NT	Com
48	Sarus crane	Grus antigone	Gruiformes	Gruidae	WL	R/LM	400	VU	Com
49	Domicile crane	Grus virgo			WL	R/LM	1	LC	R
50	White breasted water hen	Amaurornis phoenicurus		Ralide	WL	R	200	LC	Com
51	Purple Moorhen	Porphyrio porphyrio			WL	R	170	LC	Com
52	Black winged stilt	Himantopus himantopus	Charadriiformes	Recurvirostridae	WL	R	375	LC	Com
53	Eurasian thick knee	Burhinus oedicnemus		Burhinidae	T	R	35	LC	Un com
54	River lapwing	Venellus duvaucelii		Charadriidae	WL	R	200	T	Com
55	Red wetted lapwing	Vanellus indicus			T	R	245	LC	Com

56	Yellow wetted lapwing	Vanellus malabaricus			T	R	30	LC	Un com
57	Common sand piper	Actitus hypoleucos		Scolopacidae	WL	R/LM	211	LC	Com
58	Common snipe	Gallinago gallinago			WL	R/LM	303	T	Com
59	Grey plover	Pluvialis squatarola			WL	R/LM	186	LC	Com
60	Yellow legged gull	Larus mechahellis			WL	R/LM		T	Un com
61	River turn	Sterna aurantia		Laridae	WL	R	54	VU	Un com
62	Indian skeemer	Rynchops albicollis			WL	R	5	VU	R
63	House swift	Apus nipalensis	Apodiformes	Apodidae	AE	R	255	LC	Com
64	Jungle babbler	Turdoides striata	Passeriformes	Leiothrichidae	T/F	R	400	LC	Com
65	Large grey babbler	T.malcolmi			T/F	R	200	LC	Com
66	Tailor bird	Orthotomus sutorius		Cisticolidae	T/F	S V	2	LC	R
67	Weaver bird	Ploceus phillippinus		Ploceidae	T /F	SV		LC	
68	House crow	Corvus splendens		Corvidae	T	R	2300	LC	Com
69	Rufous treepie	Dendrocitta vagabunda			T	R/LM	39	LC	Un com
70	Jungle crow	Corvus macrorhynchos		Sturnidae	T	R	57	LC	Un com
71	Pied myna	Gracupica contra			T	R	200	LC	Com
72	Jungle myna	Acridotheres fuscus			T	R	234	LC	Com
73	Common myna	A.tristis			T	R	567	LC	Com
74	Oriental white eye	Zosterosps palpebrosus		Zosteropidae	T	R	50	Lc	Com
75	Black Drongo	Dicrurus macrocercus		Dicruridae	T	R	333	LC	Com
76	Greater Racket tailed Drongo	D.paradiseus			T	M	3	LC	R
77	Oriental Magpie Robin	Copsychus saularis		Muscicapidae	T/F	R	322	LC	Com
78	Red vented Bulbul	Pycnonotus cafer		Pycnonotidae	T/F	R	167	LC	Com
79	Forest wagtail	Dandronanthus indicus		Motacillidae	T/F	R	344	LC	Com
80	House sparrow	Passer domesticus		Passeridae	T	R	432	E	Com
81	Eurasian Eagle owl	Bubo bubo	Strigiformes	Strigidae	T	R/LM	43	LC	Un com
82	Motteled Wood Owl	Strix ocellata			T/F	R	34	T	Un com
83	Common Hoopoe	Upupa epops	Bucerotiformes	Upupidae	T/F	R	143	LC	Com
84	Indian Grey Hornbill	Ocyceros birostris		Bucerotidae	T	LM	232	LC	Com
85	Rose ringed parakeet	Psittacula krameri	Psittaciformes	Psittaculidae	T /F	R	1233	LC	Com

Habitat: WL = Wet land, RI = Riverine, T =Terrestrial, F= forest, AE = Aerial
Category: R = Resident, LM = Local migrant, SM = summer visitor, M = Migrant and WM= winter visitor
IUCN Status L: LC = Least concern, VU = Vulnerable, EN = Endangered, NT =near threatened, T= Threatened
Abundance: Com = Common, Un com = Uncommon, R= Rare

Table: 2 No of families and genus under various orders

S. No.	Order	No of Family	No of Genus	No of Species	Total
1	Galliformes	1	4	5	5
2	Collumbiformes	1	4	5	5
3	Coraciformes	2	2	3	3
4	Cuculiformes	1	3	4	4
5	Falconiformes	2	8	9	9
6	Pelecaniformes	3	8	11	11
7	Ciconiformes	2	7	7	7
8	Suliformes	2	3	3	3
9	Gruiformes	2	4	4	4
10	Charadriiformes	5	9	11	11
11	Apodiformes	1	1	1	1
12	Passeriformes	11	14	17	17
13	Strigiformes	1	2	2	2
14	Bucerotiformes	2	2	2	2
15	Psittaciformes	1	1	1	1
Total	15	37	72	85	85

Table 3: Number and percentage of different species of various orders

S. No	Order	No of families	% 0f families	No of genus	% of genus
1	Galliformes	1	2.70	4	5.55
2	Gruiformes	1	2.70	4	5.55
3	Collumbiforms	2	5.40	2	2.77
4	Ciconiiformes	1	2.70	3	4.16
5	Coraciiformes	2	5.40	8	11.11
6	Cuculiformes	3	8.10	8	11.11
7	Falconiformes	2	5.40	7	9.72
8	Pelecaniformes	2	5.40	3	4.16

9	Suliformes	2	5.40	4	5.55
10	Charadriiformes	5	13.51	9	12.5
11	Apodiformes	1	2.70	1	1.38
12	Passeriformes	11	29.72	14	19.44
13	Strigiformes	1	2.70	2	2.77
14	Bucerotiformes	2	5.40	2	2.77
15	Psittaciformes	1	2.70	1	1.38

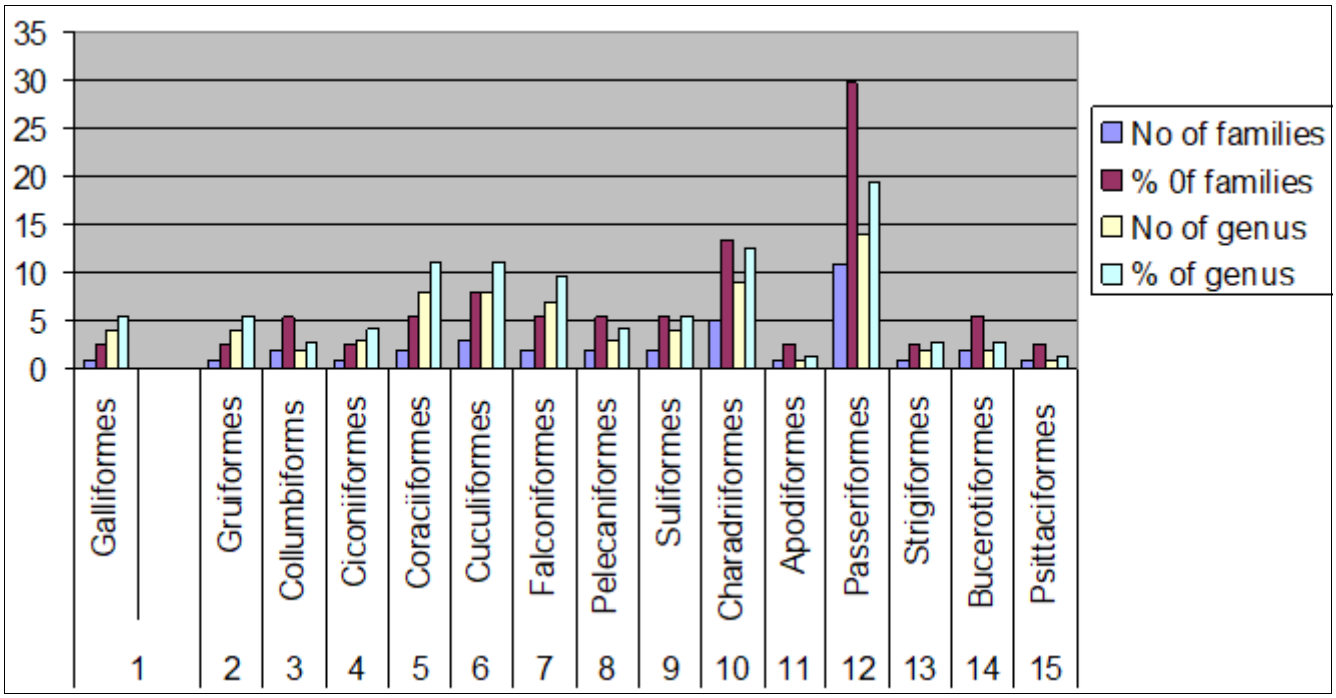


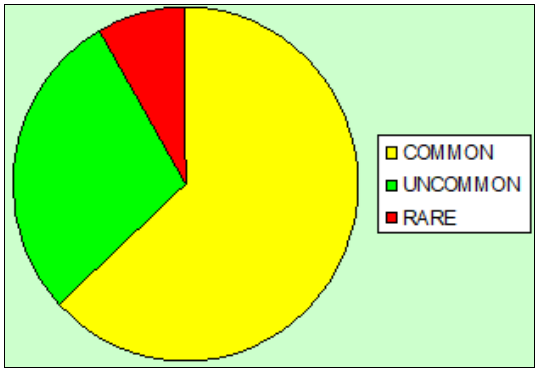
Fig 5: Figure shows in Galliformes, Gruiformes etc.

Table 4: No of species and percentage of various families under different orders

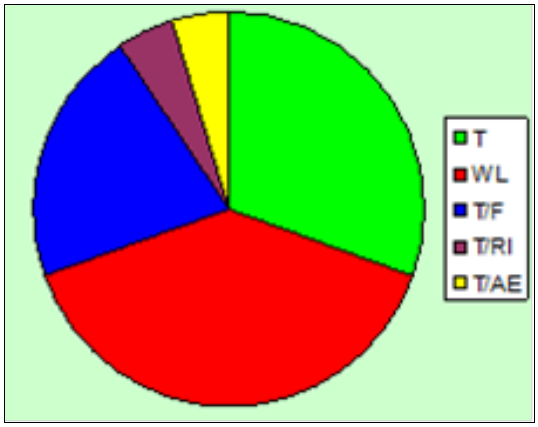
S.No	Family	No of species	% of family	S.No.	Family	No of species	% of family
1	Phasianidae	5	5.88				
2	Columbidae	5	5.88	20	Scolopacidae	4	4.70
3	Meropidae	2	2.35	21	Laridae	2	2.35
4	coracidae	1	1.17	22	Apodidae	1	1.17
5	Cuculidae	4	4.70	23	Leiothrichidae	2	2.35
6	Pandionidae	1	1.17	24	Cisticolidae	1	1.17
7	Accipitridae	8	9.41	25	Ploceidae	1	1.17
8	Ardeidae	8	9.41	26	Corvidae	2	2.35
9	Pelecanidae	1	1.17	27	Sturnidae	4	4.70
10	Threskionithidae	2	2.35	28	Zosteropidae	1	1.17
11	Ciconiidae	4	4.70	29	Dicruridae	2	2.35
12	Alcedinidae	3	3.52	30	Muscicapidae	1	1.17
13	Phalacrocorcidae	2	2.35	31	Pycnonotidae	1	1.17
14	Anhingidae	1	1.17	32	Motacillidae	1	1.17
15	Gruidae	2	2.35	33	Passeridae	1	1.17
16	Ralide	2	2.35	34	Strigidae	2	2.35
17	Recurvirostridae	1	1.17	35	Upupidae	1	1.17
18	Burhinidae	1	1.17	36	Bucerotidae	1	1.17
19	Charadriidae	3	3.52	37	Psittaculidae	1	1.17

Table 5: Habitat and threats

S.No.	Type of habitat	Observed threats
1	Terrestrial	Deforestation, Poaching, electric wires, use of fertilizers and other chemicals in crops anthropogenic activities
2	Aerial	Deforestation, electric wire and telephone tower
3	Forest	Deforestation, mining poaching, fires
4	Wet land	Deforestation, Water lifting, poaching, agricultural practices use of chemicals in crop fields, fishing, polythene in water bodies and sewage electric wires
5	River	Deforestation, Fishing, sand mining, poaching, Sewage, polythene, chemicals
6	Ponds	Deforestation, Mining, water lifting, fishing, use chemicals, polythene, chemicals sewage



Abundance Fig 6: common =62.52%, un common 28.25%, rare 8.25%



Habitat Fig 7: T=30.58%, WL=38.82%, T/RI=4.70%, T/F=21.17%, T/AE=4.70%

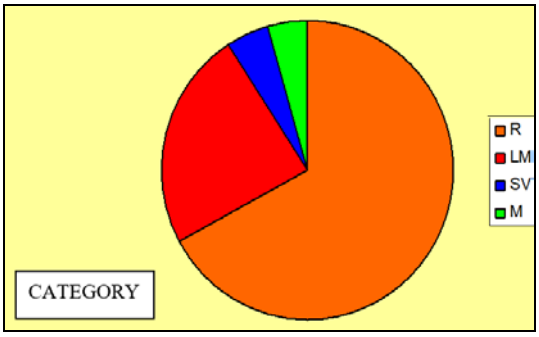


Fig 8: R=69.41%, LM=24.70%, SV=4.70%, M=1.17%, WV=0%

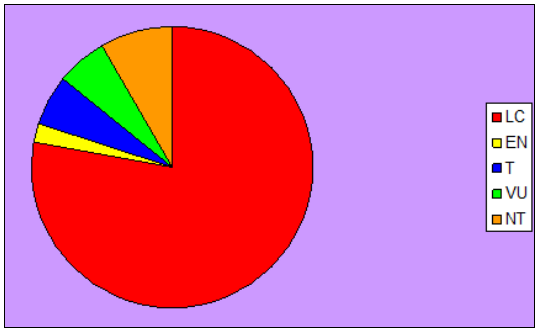


Fig 9: LC=77.64%, EN=2.43% VU=5.88%, NT=5.88%, T=8.23%

Discussion

The similar study was various researchers, a total 97 bird species were recorded and belonging to 78 genera, 41 families and over 20 orders were noticed. Of these 97 bird species in Dabarusinghi reservoir [1] {The stautus and distribution of chambal river was studied by C.P Singh *et al*. [2] where as 124 bird species belonging to the 52 families were recorded across Anantapuramu dt. Accipitridaewas found to be the most dominant family consisting of 16 species in the study area [3]. Rubina and Ganesh studied on Avifaunal diversity status in lakes of Dharwad, Karnataka State [4]. The water bodies supports a rich biodiversity with a

The study revealed presence of 311 species, belonging to 18 Orders and 70 families in different habitats in and around KVNP and MFR. Out of these 311 species, 10 species [5] Wetlands directly and indirectly support of birds by providing ecological services [6]. Presently human and manmadeanthropogenic activities cause alterations of wetlands. Changes in wetland. Arish *et al*. studied wetland ecosystem. During the study of shivaji prabhaker chaavan study 105 species belongs to 14 Orders and 40 Families were recorded in winter season, year 2018, out of that the distribution and characteristics was 64 (60.9%) migratory, 41 (39.0%) Resident, 04 (3.8%) Near Threatened, 6 (5.17%) Abundant, 36 (34.2%) Occsional, 43 (40.9%) Common, 20 (19.0%) Rare. Winter migratory species were 16 (15.2%). Maximum number was of different duck species (Ansariformes) with species diversity 14 (14.3%). Winter season is population and diversity rich period fish and algae form major food for birds. black necked stork thet is Nt species incounter thrice in survey domicile crane observe only once in chambal survey taylor bird ony sighted once in forest area.in frest of chambal nregion found many hanging nest of weaver birds.

The highest species diversity was observed during the wet period. months of November December and also in Monsoon period The large group of wetland birds consists mainly of cormorants Darters opinbills painted storks, sarus crane, moorhens eagrets, black necked storks, lapwings pond herons, water hens black and white ibis sand pipper kingfishers etc whlile in terrestrial habitats main birds were webler, Indian peafowl, Coucal, Paroot pigeon doves hope pheasants hoopoe mynas etc. The population of anadidae is highest in migrant.

Conclusion

New small water bodies of kaswa Bakewar, Ajitmal Ekdil, road and canal side Chambal and Yamuna, Sanger river plays a vital role in the annual cycle of the non-migratory birds and serves breeding, feeding, moving, mating grounds for several resident species. Birds either resident or migratory according to their occurrence, frequency and population they have been assigned various categories. Order Passeriformes was more dominant in the total population. Status of birds was classified as Resident species, Local migratory (Resident of India) and winter and Summer visitors (International) which are found in the study area only certain period. River Chambal is good abode for many species but specially birds. Indian national bird peacock were found to be searching new habitat around human habitat due to disturbance of natural habitat due to deforestation. Population of passer domesticus is higher in forest than villages.

Acknowledgement

The authors team is highly thankful to the Principal and general secretary of Janta Maha Vidyalaya Ajitmal Auraiya for permitting to us for this study. We are also highly grateful to Mr. S.B, Mishra (retired depuity forest ranger from NCS) for their rigorous support for field survey. The authors would like to thanks my colleague Sachin Jain who support me for

this study.

References

1. Grimmett R, Inskipp C, Inskipp T. Birds of the Indian Subcontinent. Oxford University Press, New Delhi. 1998.
2. Ali S, 1996. The Book of Indian Birds, 13th edition, Bombay Natural History Society & Oxford University Press, Bombay. 1941, 1-412.
3. Al S, Ripley SD. The books of the bird of India and Pakistan Oxford University Press. Bombay, London, New York. 1968; 74:1-10.
4. Peterson AW. Destruction of birdlife in Minnesota IV. Birds killed at Park Rapids. Flicker. 1963;35(4):113.
5. Rahmani Asad R, Gayatri Ugra. Birds of wetlands and Grasslands. 1980, 43.
6. Ehrlich PR, Dobkin DS, Wheye D, Pimm SL. The Bird Watcher‟s Handbook: A Guide to the Natural History of the Birds of Britain and Europe" Oxford University Press, Oxford, 1994.
7. Kazmierczak K, Singh RA. Bird Watchers Guide to India UK. Ali, Ripley. Hand Book of the Birds of India and Pakistan. 2001;6:77.
8. Kazmierczak K, Van Perto B. Field Guide to the Birds ofthe Indian Subcontinent, 2000.
9. Ali S. The Book of Indian Birds, 13thedition, Bombay Natural History Society & Oxford University Press, Bombay. 1941-1996, 1-412
10. Grimmet RC, Inskipp Inskipp T. Birds of Indian Subcontinent Oxford University Press. Delhi. 2001, 384.
11. Manakkadan R, Pittie A. Standardized common and scientific names of the birds of the Indian subcontinent" Buceros. 2001;6(1):1-37.
12. Inskipp T, Lindsey N, Duckworth XW. An annotated checklist of the birds of the oriental region Oriental Birds Club, Sandy U.K., 1994.
13. Bala Subramanyam VV. Avifaunal diversity of Anantapuramu (semi-arid) District, Andhra Pradesh India. International Journal of Zoology and Applied Biosciences. 2018; 3(2):426-439.
14. Rubina M, Nadaf CB, Ganesh D. A Study on Avifaunal Diversity Status in Lakes of Dharwad, Karnataka State. J Ecophysiol. Occup. Hlth. 2016;16(1, 2):13-21.
15. Krishnan M. Birds of Southern India, 1981;CII23:26-31.
16. Sbbarao G, Bhaskar MK. Birds and Bird Watching In India 1ST edition 2019 graphic media Bengaluru Karnataka.