



# DIVERSITY AND RICHNESS OF BIRD SPECIES IN SARAN DISTRICT, BIHAR, INDIA

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## ABSTRACT

Birds are a dynamic species and natural bio-indicator of the richness of biodiversity of any area. Mixed vegetation of rivers, forest cover areas, and wetlands provide a suitable site for bird's habitat and it indicates ecosystem quality. Saran District is moderately healthy diversity and richness of bird species, which is a good indicator of ecosystem quality. Rivers and wetlands increase the number and diversity richness of bird species in Saran District. The diversity richness of bird species in Bihar and in Saran District is gifted and influenced by many green belt areas and rivers basin of Ganga River, Ghagra River, Gandak River, Bhagmati River, Kosi River, Mahananda River, and Daha River. Due to supporting environment, number of bird species and riparian bird species number are in moderate amount. Point count methods were laid out for counting the bird species richness. During the time period of survey, a total number of 158 species of birds belonging to 53 families, 20 orders have been recorded. Out of which 111 species were resident, 45 species were winter migratory birds, and only 2 species were summer migrant. Order Passeriformes show the highest number of bird species than order Accipithiformes. Family Corvidac and family Ardeidac shows the healthy number of populations. Family Psittacidac shows lower number of populations. Hence this study was to obtain diversity and richness of bird species in Saran district and to prepare a checklist of birds and to compare bird diversity.

**Keywords:** Diversity, simplification, moderately, riparian, resident, migratory

## INTRODUCTION

In the year 1908, Saran district is divided into three Sub-division for example Siwan, Gopalganj and Saran was put in newly created Tirhut division. Saran district are well known for its highly biodiverse are due to its mixed vegetation. Saran is quite hostile for diversity of birds i.e.; variety of birds can be easily seen. Saran district provides wide range of habitats for the birds. Diversity of birds constitute a major part of natural environment and plays act as an agent for pollination of flower, food chain sources, dispersal of seeds and crack down seed dormancy (Nason, 1992). Diversity of bird species play a vital role in ecology to evaluate different habitats a great extend (Bilgrami, 1995). Due to great disturbances made by human beings, birds diversity lost day by day regularly (Rapoport, 1993) and climate change (Chen et al., 2011; Sekercioglu et al.,2012).

Climate change is a major concern now a day. Common birds of a locality should be monitor to a topic of concern a sustainable development of environment (Furness and Greenwood, 1993; Newton,1995; Ali, 1996; Daniels, 2005; Chamberlain et al., 2007; Rotenberry and Wiens, 2009). The most productive ecosystems are wetlands which have a great role for supporting life are in habited by so many animal species including birds. Productivity of wetland ecosystem and ecology condition are indicated by wetland birds (Wei et al., 2009). Water birds number using a wetland site is a good indicator of the site's biological importance (Scott,1980). Structurally complex natural habitat that's why it provided higher level of niche space for birds and accommodates diverse ways of exploitation of natural environment which alternately increased species richness (Tews et al, 2004).

## **MATERIAL AND METHOD**

**Study period:** Dec 2019 to Aug 2022

### **Study Area:**

Saran district have various habitats like agriculture, urban, sub-urban, residential and forest depending of the human impact. The Saran district covers 2641 km sq. geographical area which is highly biodiverse area due to Ganga River basin and its tributaries. In Saran District there is no research work done till now on the bird diversity that's why I select Saran district for my survey

### **Counting Birds:**

By using the point count technique (Bibby et al. 1992). From all sites like urban, sub-urban, residential and forest depending of the human impact samples were taking. Counting in all points was made by me from 6am – 9am and 3pm-6pm. To determine abundance point count is used for a fixed period of time from a fixed location. To estimating density line, transect method was used.

### **Instrument used:**

The instrument used for photography of birds is DSLR-D5600 having 24.2 megapixel and upper-entry level and also APS-C sensor.

### **Bird Watching Technique:**

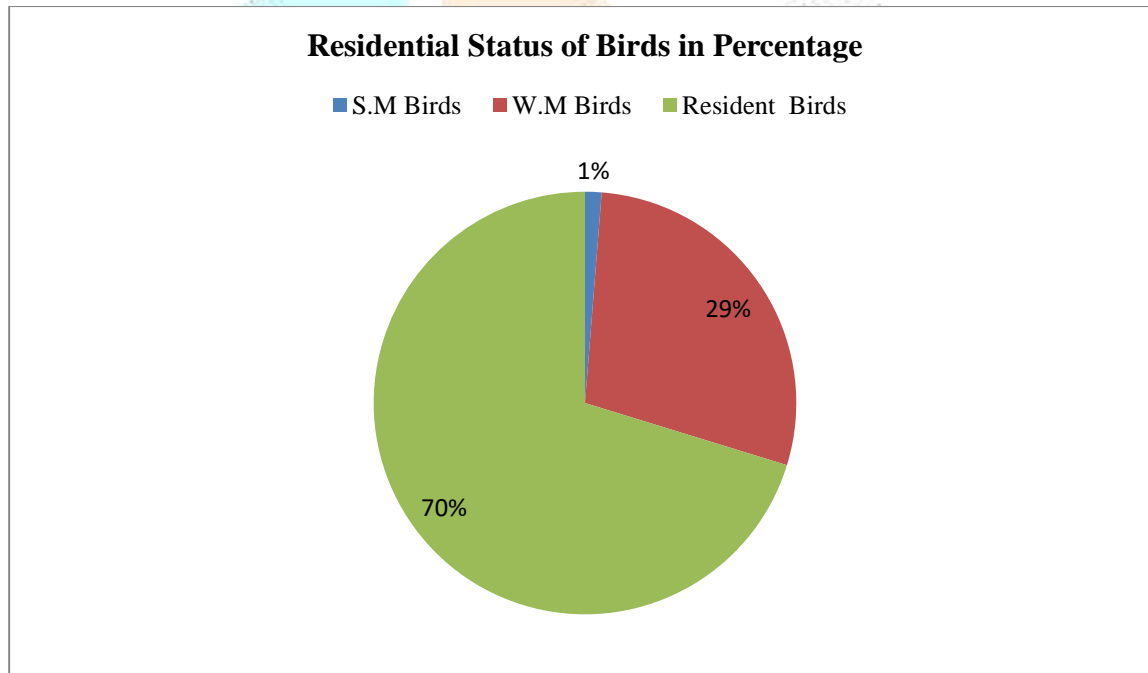
Birds are highly energetic animals. Its movement is drastically fast. So, identifying a bird is challenging. In each observation stationary and flying stages were noted. Observations was confirmed with the help of Avibase-Bird Checklists of the world Saran (Chapra) 2020.

## **RESULT AND DISCUSSION**

During the time period of survey, a total number of 158 species of birds belonging to 53 families, 20 orders have been recorded. In which 111 bird species are resident, 47 are migrant (45 are winter migrant and 2 are summer migrant). Order Passeriformes show the highest number of bird species than order Accipithiformes. Family Corvidac and family Ardeidac shows the healthy number of populations. Family Psittacidac shows lower number of population and not loving to residential areas due to its social demands of birds are also cause in decreasing in the number of bird's population. By nature's gift Saran have a highly biodiverse area. Its richness in diversity ultimately increased bird's diversity and its richness. Rivers and wetlands also increase its diversity and extensively affect avifaunal diversity. The magnitude of bird species richness was high where shrub cover area is high and low with small shrub area. Cutting down of trees are significantly affect the negative impact of bird's population. Habitats simplification was the major cause of the declination in the number of bird species. Cutting down the forest for many other purposes was also affected the species richness of bird's diversity. Grassland, shrub, bush and agricultural field covers give positive impact on this component.

We should to avoid habitat simplification by stop cutting down trees and manufacturing building which causes habitat loss of the bird species. We should also implement strict rules and punishment for poaching bird, gaming with birds and hunting birds. Besides it there are too many economically importance are also causes of declination in number of birds. We should strictly avoid black marketing of bird trade. We adopt some activities for doing better for our environment like having some grains and put water on our roofs. It may increase number of birds because birds have ecofriendly in nature. When they realize humans are not harmful for him, they will start living with us in residential areas. In recent decades, global biodiversity conversation becomes the issue of primary value (Turner et al., 1990 Ehrlich and Wilson, 1991). Checklist of birds on a wide range gives much more importance than short period of time on applying biodiversity estimation (Charavarthy and Sridhar, 1995 Roy et al., 2011).

Present survey which recorded 158 bird species show a moderately healthy biodiverse area but due to many anthropogenic activities its diversity is facing problems. Many natural sites also facing the highly disturbance by human activities for the purpose of urbanization, fuel wood collection and pollution (Islam and Rahmani, 2004; Malick, 2010; Karmakar, 2011). The purpose of study is that, there is no single research done on bird's diversity in Saran district. Birds' species recorded during my survey is shown in table.1 and percentage of residential status of birds are shown in fig.1.



**Fig.1 Residential status of birds in percentage**

Here: WM=Winter Migrant, SM=Summer Migrant

Table.1. Bird Species in Saran District, Bihar, India

Bird Species in Saran District					
No.	Order	Family	Zoological Name	Common Name	Migrative Status
1	Accipitiformes	Accipitridae	<i>Milvus migrans</i>	Black kite	R
2			<i>Haliastur indus</i>	Brahmini kite	R
3			<i>Haliaeetus leucoryphus</i>	Pallas Fish Eagle	WM
4			<i>Elanus caeruleus</i>	Black winged kite	R
5			<i>Accipiter badius</i>	Shikra	R
6			<i>Buteo buteo</i>	Common Buzzard	SM
7			<i>Elanus caeruleus</i>	Black Shouldered Kite	R
8			<i>Circus Macrourus</i>	Pallid Harrier	WM
9			<i>Buteo rufinus</i>	Long legged Buzzard	WM
10			<i>Milvus migrans</i>	Black Eared Kite	WM
11			<i>Aquila nipalensis</i>	Stepple Eagle	WM
12	Accipitriformes	Pandionidae	<i>Pandion haliaetus</i>	Osprey	WM
13	Anseriformes	Anatidae	<i>Anas Poecilorhyncha</i>	Indian Spot Billed Duck	R
14			<i>Lxobrychus sinensis</i>	Yellow bittern	R
15			<i>Anus crecca</i>	Common Teal	WM
16			<i>Spatula querguedula</i>	Garganey	WM
17			<i>Anus acuta</i>	Northern Pintail	WM
18			<i>Spatula clypeata</i>	Northern Shoveler	WM
19			<i>Mareca penelope</i>	Eurasian Wegion	WM
20			<i>Anas strepera</i>	Gadwall	WM

21	Apodiformes	Apodidae	<i>Cypsiurus balasiensis</i>	Palm Swift	R
22	Bucerotiformes	Bucerotidae	<i>Ocyrceros Birostris</i>	Indian Grey Hornbill	R
23	Bucerotiformes	Upapidae	<i>Upupa epops</i>	Hoopoe	R
24	Caprimulgiformes	Caprimulgidae	<i>Caprimulgus jotaka</i>	Grey nightjar	R
25			<i>Caprimulgus asiaticus</i>	Indian nightjar	R
26	Charadriiformes	Charadriidae	<i>Charadrius dubius</i>	Little Ringed plover	WM
27			<i>Vanellus indicus</i>	Red wattled Lapwing	R
28			<i>Vanellus mallbaricus</i>	Yellowwattled Lapwing	R
29	Charadriiformes	Glareolidae	<i>Glareola lactea</i>	Small Pratincole	R
30	Charadriiformes	Recurvirostridae	<i>Recurvirostra avosetta</i>	Pied Avocet	WM
31			<i>Himantopus himantopus</i>	Black Winged Stilt	WM
32	Charadriiformes	Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	WM
33			<i>Tringa ochropus</i>	Green Sandpiper	WM
34			<i>Tringa glareola</i>	Wood Sandpiper	WM
35	Charadriiformes	Laridae	<i>Ichthyaetus ichthyaetus</i>	Palla's Gull	WM
36			<i>Chroicocephalus ridibundus</i>	Black Headed Gull	WM
37			<i>Chroicocephalus brunnicephalus</i>	Brown Headed Gull	RM
38	Ciconiiformes	Ciconiidae/stork	<i>Anastomus oscitans</i>	Open billed stork	R
39			<i>Ciconia episcopus</i>	Woody necked stork	RM
40			<i>Mycteria leucocephala</i>	Painted Stork	R
41	Columbiformes	Columbidae	<i>Spilopelia</i>	Spotted dove	R

			<i>chinensis</i>		
42			<i>Streptopelia decaocto</i>	Eurasian collard dove	R
43			<i>Spilopelia senegalensis</i>	Laughing dove	R
44			<i>Streptopelia orientalis</i>	Oriental turtle dove	M
45			<i>Columba livia</i>	Blue rock pigeon	R
46			<i>Chalcophaps indica</i>	Emerald dove	
47			<i>Treron phoenicoptera</i>	Yellow footed Green Pigeon	R
48	Coraciiformes	Cerylidae/Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher	R
49			<i>Halcyon smyrnensis</i>	White breasted/throated kingfisher	R
50	Coraciiformes	Coraciidae	<i>Coracias benghalensis</i>	Indian Roller	R
51			<i>Eurystomus orientalis</i>	Dollar Bird	WM
52	Coraciiformes	Meropidae	<i>Merops orientalis</i>	Green Bee- eater	R
53			<i>Merops philippinus</i>	Blue Tailed Bee-eater	SM
54			<i>Merops oreobates</i>	Chestnut Headed Bee- eater	R
55	Cuculiformes	Cuculidae	<i>Eudynamis scolopaceus</i>	Koel	R
56			<i>Hierococcyx varius</i>	Hawk-cuckoo	R
57			<i>Eudynamis scolopac</i>	Asian cuckoo	R
58			<i>Clamator jacobinus</i>	Pied/jacobin cuckoo	M
59	Falconiformes	Falconidae	<i>Falco tinnunculus</i>	Eurasian Kestrel	WM
60			<i>Falcon</i>	Peregrine Falcon	WM

			<i>peregrinus</i>		
61	Galliformes	Phasianidae	<i>Francolinus pondicerianus</i>	Grey Francolin	R
62			<i>Pavo cristatus</i>	Indian Peafowl	R
63			<i>Gallus gallus</i>	Red Jungle fowl	R
64	Gruiformes	Rallidae	<i>Amaurornis phoenicurus</i>	Water Hen	R
65			<i>Fulica</i>	Coot	R
66			<i>Porphyrio porphyrio</i>	Purple Moorhen	R
67			<i>Gallinula chloropus</i>	Indian Moorhen	R
68	Passeriformes	Acrocephalidae	<i>Acrocephalus dumetorum</i>	Blyth's Reed Warbler	WM
69			<i>Acrocephalus agricola</i>	Paddyfield warbler	WM
70	Passeriformes	Aegithinidae	<i>Aegithina tiphia</i>	Common Lora	R
71	Passeriformes	Alaudidae	<i>Eremopterix griseus</i>	Ashy crowned Sparrow lark	R
72			<i>Mirafra assamica</i>	Bengal Bush lark	R
73			<i>Mirafra erythroptera</i>	Indian Bush Lark	R
74			<i>Alauda gulgua</i>	Oriental Skylark	R
75	Passeriformes	Artamidae	<i>Artamus fuscus</i>	Ashy Wood Swallow	R
76	Passeriformes	Cisticolidae	<i>Orthotomus sutorius</i>	Tailor bird	R
77			<i>Prinia inornata</i>	Plain prinia	R
78			<i>Prinia socialis</i>	Ashy prinia	R
79			<i>Prinia gracilis</i>	Graceful prinia	R
80	Passeriformes	Corvidae	<i>Corvus splendens</i>	House crow	R
81			<i>Corvus culminatus</i>	Indian jungle crow	R
82			<i>Dendrocitta</i>	Rufous treepie	R

			<i>vagabunda</i>		
83			<i>Corvus macrorhynchos</i>	Large billed crow	R
84			<i>Centropus sinensis</i>	Pheasant crow/Greater coucal	R
85	Passeriformes	Dicruridae	<i>Dicrurus macrocercus</i>	Black Drongo	R
86			<i>Dicrurus caerulescens</i>	White Bellied Drongo	R
87			<i>Dicrurus bracteatus</i>	Spangled Drongo	M
88			<i>Dicrurus paradiseus</i>	Greater Racket Tailed Drongo	R
89	Passeriformes	Estrilidae	<i>Lonchura atricapilla</i>	Black Headed/Chestnut Munia	R
90			<i>Lonchura Malacca</i>	Tri Coloured Munia	R
91	Passeriformes	Hirundinidae	<i>Cecropis daurica</i>	Red Rumped Swallow	WM
92			<i>Riparia paludicola</i>	Plain Martin	R
93			<i>Hirundo rustica</i>	Barn swallow	WM
94			<i>Riparia diluta</i>	Pale Sand Martin	WM
95	Passeriformes	Lanidae	<i>Lanius cristatus</i>	Brown Shrike	WM
96			<i>Lanius vittatus</i>	Bay Backed Shrike	R
97	Passeriformes	Leiothrichidae	<i>Turdoides striata</i>	Jungle Babbler	R
98			<i>Turdoides caudata</i>	Common Babbler	R
99	Passeriformes	Motacillidae	<i>Motacilla maderaspatensis</i>	White Browed Wagtail	R
100			<i>Motacilla alba</i>	White Wagtail	WM
101			<i>Motacilla flava</i>	Yellow Wagtail	WM
102			<i>Motacilla citreola</i>	Citrine Wagtail	WM
103			<i>Anthus rufulus</i>	Paddy Field Pipit	R



104			<i>Anthus campestris</i>	Tawny Pipit	WM
105	Passeriformes	Muscicapidae	<i>Phoenicurus ochruros</i>	Black Redstart	R
106			<i>Luscinia svecica</i>	Blue throat	WM
107			<i>Saxicoloides fullicatus</i>	Indian Robin	R
108			<i>Cercomela fusca</i>	Brown Rock Chat	R
109			<i>Copsychus saularis</i>	Magpie Robin	R
110			<i>Saxicola caprata</i>	Pied Bushchat	R
111			<i>Eumyias thalassinus</i>	Verditer Flycatcher	R
112			<i>Saxicola rubicola</i>	Stone Chat	M
113	Passeriformes	Nectariniidea	<i>Cinnyris asiaticus</i>	Purple Sunbird	R
114	Passeriformes	Oriolidae	<i>Oriolus larvatus</i>	Black Headed oriole	R
115			<i>Oriolus kundoo</i>	Indian Golden Oriole	R
116	Passeriformes	Paridae	<i>Periparus ater</i>	Coal Tit	R
117	Passeriformes	Passeridae	<i>Passer domesticus</i>	House Sparrow	R
118			<i>Passer montanus</i>	Tree Sparrow	R
119			<i>Petronia xanthocollis</i>	Yellow Throated Sparrow	R
120	Passeriformes	Phylloscopidae	<i>Phylloscopus collybita</i>	Common Chiff Chaff	WM
121			<i>Phylloscopus trochiloides</i>	Greenish Warbler	WM
122			<i>Phylloscopus humei</i>	Hume's Warbler	WM
123	Passeriformes	Ploceidae	<i>Ploceus philippinus</i>	Bata Weaver	R
124	Passeriformes	Pycnonotidae	<i>Pycnonotus cafer</i>	Red Vented Bulbul	R
125			<i>Pycnonotus jocosus</i>	Red Whiskered Bulbul	R

126	Passeriformes	Rhipiduridae	<i>Rhipidura albicollis</i>	White Throated Fantail	R
127	Passeriformes	Sturnidae	<i>Acridotheres tristis</i>	Common Myna	R
128			<i>Acridotheres ginginianus</i>	Bank Myna	R
129			<i>Acridotheres fuscus</i>	Jungle Myna	R
130			<i>Gracupica contra</i>	Pied Myna	R
131			<i>Sturnidae</i>	Pied Starling	R
132			<i>Sturnidae pagodarum</i>	Brahminy Starling	R
133	Passeriformes	Turnidae	<i>Turdus atrogularis</i>	Dark Throated Thrush	M
134	Passeriformes	Zosteropidae	<i>Zosterops palpebrosus</i>	Indian White Eye	R
135	Pelecaniformes	Ardeidae	<i>Ardea purpurea</i>	Purple Heron	R
136			<i>Egretta garzette</i>	Little Egret	R
137			<i>Casmerodius albus</i>	Great Egret	R
138			<i>Ardea cinerea</i>	Grey Heron	R
139			<i>Ardeola grayii</i>	Pond Heron	R
140			<i>Bubulcus ibis</i>	Cattle egret	R
141			<i>Ardea intermedia</i>	Median Egret	R, M
142			<i>Anser indicus</i>	Bar Headed Goose	WM
143			<i>Dendrocygna javanica</i>	Lesser whistling teal	R
144			<i>Netta rufina</i>	Red Crested Pochard	R, M
145	Piciformes	Megalaimidea	<i>Megalaima haemacephala</i>	Coppersmith Barbet	R
146			<i>Megalaima zeylanica</i>	Brown Headed Barbet	R
147	Piciformes	Picidae	<i>Picus canus</i>	Grey Headed	R

				Woodpecker	
148	Podicipediformes	Podicipedidae	<i>Podiceps cristatus</i>	Great Created Grebe	WM
149	Psittaciformes	Psittacidae	<i>Psittacula eupatria</i>	Alexandrine Parakeet	R
150			<i>Psittacula roseata</i>	Blossom Headed Parakeet	R
151			<i>Psittacula cyanocephala</i>	Plum Headed Parakeet	R
152			<i>Psittacula krameri</i>	Rose Ringed Parakeet	R
153	Strigiformes	Strigidae	<i>Anthene brama</i>	Spotted Owlet	R
154			<i>Bubu bengalensis</i>	Indian Eagle Owl	R
155	Strigiformes	Tytonidae	<i>Tyto alba</i>	Barn Owl	R
156	Suliformes	Phalacrocoracidae	<i>Microcarbo niger</i>	Little Cormorant	R
157			<i>Phalacrocorax carbo</i>	Great Cormorant	R
158			<i>Phalacrocorax fuscicollis</i>	Indian Cormorant	R
<p><b>Acronyms---R=Resident, WM=Winter Migrant, SM=Summer Migrant</b></p> <p><b>Distribution Status---Resident=111, Migrant=47(Winter Migrant=45 &amp; Summer Migrant=2)</b></p> <p><b>Summary Data-----Total Orders=20, Total Families=53, Total Species=158</b></p>					

Birds are natural bio-indicator of the richness of biodiversity of any area. But due to extensive progression of urbanization, use of chemicals for fulfilling food demands of rapidly increasing population there is a rapid decline of natural habitat of birds which has critically damaged the nesting and feeding grounds of birds. Besides it, increasing number of game hunting and commercial exploitation of the birds are also affecting the avian diversity. Urban habitats are totally different from nonurban or “natural” habitat. Anthropogenic activities transform natural green areas into anthropogenic structure are major causes of habitat destruction. Birds are forced to either accept or avoid the new conditions to survive in the city’s housing. New urbanized condition has changed avian diversity dramatically, which losses local biodiversity. Urban housing is a major threat to biodiversity. Urbanization and deforestation destroy the natural habitat. These are along with pollution are major threat to birds. Many birds were seen with some sort of plastic or wrapper in their beak. This leads to death of birds and ultimate result in birds decline.

In my present study there were many variations noticed in habitat and food pattern of local birds which were shown in table.2. Residential and IUCN status were also shown in this table. All bird's species in the given table.2. are in least concern (LC) while **Pallas's Fish Eagle** (which is water dependent, resident/migratory bird) is vulnerable, so it must take serious attention.

**Table.2. Behaviour patterns of Local Birds**

Birds Species	Habitat	Foods	Residential Status	IUCN Status
Little Cormorant	Water bird	Fishes, amphibians	Resident/Migrant	LC
Egret	Water bird	Fishes, amphibians	Resident/Migrant	LC
Indian Pond Heron	Water bird	Fishes, amphibians, molluscus	Resident	LC
Asian openbill stork	Water bird	Fishes amphibians, insects	Resident	LC
Black kite	Jungle, open forest, trees	Carnivorous, small animals, birds	Resident	LC
Pallas's Fish Eagle	Water depend bird	Carnivorous, fishes, amphibians	Resident/Migratory	Vulnerable
Purple Moorhen	Water bird	Fishes, amphibians	Resident	LC
Salikh	Urban, open woodland cultivation	Omnivorous, insects, grains, fruits	Resident	LC
House crow	Human settlement	Fruits, insects, grains	Resident	LC
Bulbul	Forests, cultivated lands	Petals, fruits, insects, nectar	Resident	LC
Dove	Human settlement	Grass, seeds, termite	Resident	LC
Owl	Thickly foliaged trees	Rodents, small mammals	Resident	LC
Kingfisher	water dependent birds	Fish, amphibians	Resident	LC
Pied harrier	Cultivation, scrubs, forest	Insects	Resident) Migratory	LC
Asian koel	Evergreen forest, gardens, thick scrubs	Caterpillar, insects, fruits	Resident	LC

Baukathakau	Open woodland and cultivation	Insects, fruits	Resident/Migratory	LC
Bak	Marshy wetland	Fishes, Amphibians	Resident/Migratory	LC
Rose ringed parakeet	Thickly foliated trees	Fruits, vegetables	Resident	LC
Black drongo	Open woodland cultivation, open forest	Insects	Resident	LC
Baya weaver	Urban habitat, open woodland cultivation	Omnivorous	Resident	LC

Here; **LC= least concern**

The bird is a very beautiful creature and this creature is very dynamic and generally seen 78% involved in feeding, 15% involved in loafing and 7% involved in breeding activities (Table.3) during my study period and according to the finding of Abdar Mohan Ramchandra (2013), 68% involved in feeding, 27% involved in breeding and 5% involved in loafing.

**Table: 3. Activities of bird species of Saran District in my survey**

S.No.	Activities of Bird Species	Frequency in Percentage (%)
1.	Feeding	78%
2.	Breeding	7%
3.	Loafing	15%

## CONCLUSION

Saran district (Bihar) reflects a moderately healthy biodiversity due to Ganga River basin. Nearly 158 species of birds both resident and migratory belonging to 53 families were recorded. But this area is also affected by urbanization and pollution that are finally affecting the bird diversity in this area. So, to save this beautiful creature we should aware.

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## CONFLICT OF INTEREST

No conflict of interest.

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