

BIRD POPULATION PRESENT IN POWER GRID TRANSMISSION LINE STUDY AREA IN KORBA FOREST DIVISION

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Abstract: The Study has been carried out to find the bird diversity on construction of Power Grid Transmission Line activity in Kartala Forest Range, Chhattisgarh, for the period from July 2018 to April 2019. A total of 28 bird species belonging to 23 families were recorded during the study period. The study also brought out eight types of feeding habits among the identified species. Most of the species recorded in the study area were residents. The study underlines the importance of green space around Power grid ecosystems as preferred habitats for bird populations. The Study area have been located in Kartala Forest Range under the Korba Forest Division, which includes core area 26.5789 ha area and surrounding 5 km area, considered as buffer and then compared diversity for both the areas. Major disturbances in core area affecting bird diversity include large amount of habitat degradation due to clear felling of tree and high-tension transmission line vibration, vehicle moment and anthropogenic pressure. Buffer area of transmission line having good forest and agriculture land, provides suitable habitat for birds.

Keywords: Birds, Species, Diversity, Transmission line, Forest.

I. INTRODUCTION

The Indian subcontinent is very rich in biodiversity according to an estimate total a of 1300 bird species found in Indian subcontinent, out of the more than 9000 bird species of the world, over 13% of the world's bird fauna are found in India.[1] The bird population is an indication of environmental changes as they respond fast to threats and changing environment conditions. [2] The study area have been located in Kartala Forest Range under the Korba Forest Division which includes core area 26.5789 ha area and surrounding 5 km area, considered as buffer and then compared diversity for both the areas. There were some major disturbances affecting the bird diversity like vibration sound pollution, habitat degradation due to tree felling and ground digging, vehicle moment and anthropogenic pressure.[3] Some impacts are confined to the Power Grid site in the short term; others have far - reaching long - term effects. The most direct effect on birds is the destruction or displacement of species that have disturbed their habitat in areas of deforestation. Safeguarding the unique biodiversity of this important region is therefore a high conservation priority, and extensive research is required to determine more precisely how habitat loss and change impacts upon biodiversity so that effective measures may be taken to mitigate these impacts. However, due to its isolation, current understanding of the ecological associations of birds communities in this area limited. [4]

II. STUDY SITE

The study site is located in Korba Forest Division, Kartala Range near Kerwaduari village forest compartment number P1171& OA 1485. The Power Grid area is located at a distance of about 40 km from Korba, 5 kms from Korba Rampur

road, Kerwaduari village located at 22°13'15 North latitude and 82°51'31 East longitude. Study area divided into two parts core and buffer. Study area surrounded by open forest in which Palas (*Butea monosperma*) and Char (*Buchanania lanzan*) are dominant tree species.



Figure 1. Map of study area transect line Kerwaduari, Kartala Range

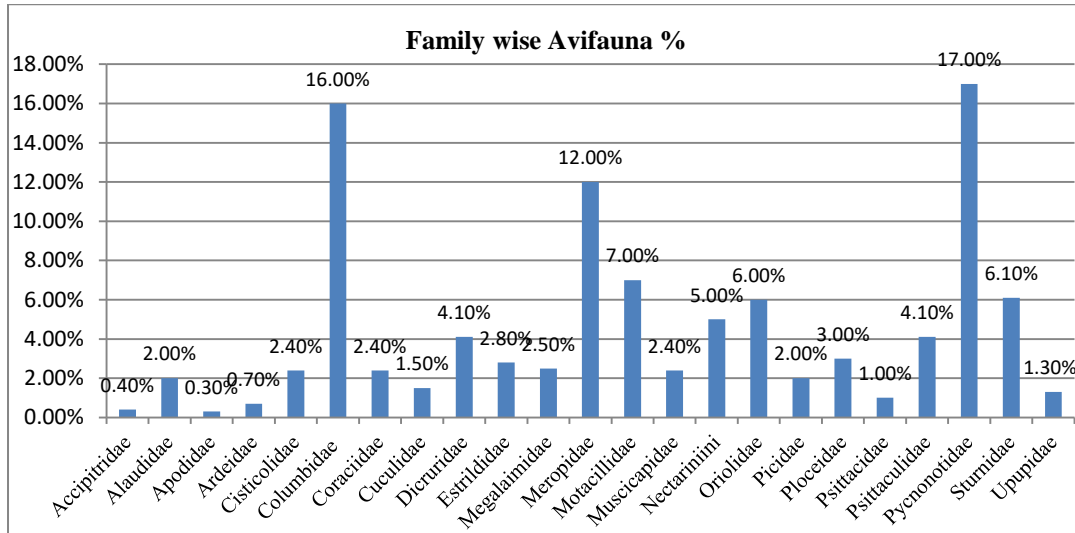
III. MATERIAL AND METHODS

Major surveys for the estimation and counting of birds were conducted between the month of July 2018 to April 2019 by using a transect line approach.^[5] For extensive survey of whole power grid area so to assess the status of birds and to identify the habitats pattern used by the birds. For each line transect, three observers had walked along the path, and independently recorded the number of species and individual birds in the study area with the aid of binoculars. Photographs had also been taken to aid in the identification process. Total 15 line transect were taken. During the field surveys conducted line transect of 1.20 km (mostly used a path / trail followed by the villagers to enter in the forest) in which distance sampling were taken in every 300 m in the transect to estimate the population of birds, its habit, habitat and nesting pattern including the floral diversity of the Power grid study area. A circular sample plot of 10 m radius had been taken in each transect at an interval of 300 m i.e. total 5 sample plots made in one transect in which vegetation composition (grass, herb, shrub and regeneration) and all tree species data had been taken including height and girth (using meter tape) along with the counting of birds. Instead of transect line, birds were also recorded between two transect line and considered only in checklist. Perch heights of individuals have also recorded to find out the utilization of vertical dimension by birds. Perch height class of all the birds has recorded in case of all direct sightings. All the birds were identified using the standard field guides.^[6]

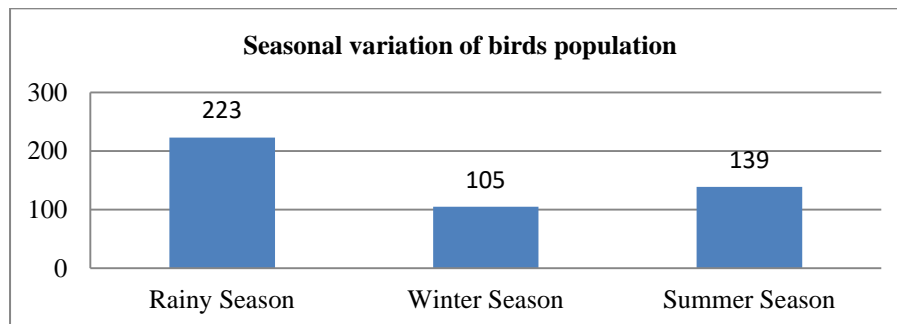
IV. RESULTS AND DISCUSSION

The Study revealed that the surveyed areas, where 15 line transect were taken in three different seasons including rainy, winter and summer, out of which 05 line transect were surveyed in rainy and 05 line transect surveyed in winter and the rest 05 transect surveyed in the summer season, on study, the existing birds population with its habitat, and existing flora and birds were registered. According to seasonal survey, 467 individual species of birds have been recorded from 28 different species of 23 families. Here 28 bird species are Least Concerned (LC) and Resident. As per recorded data, Red Vented Bulbul (*Pycnonotus cafer*), Green Beater (*Apus affinis*), Paddy Field Pipit (*Anthus rufulus*), Laughing Dove (*Spilopelia senegalensis*), Spotted Dove (*Streptopelia chinensis suratensis*), Golden Oriole (*Oriolus kundoo*) and Common Myna (*Acridotheres tristis*) dominated population of birds species. During field survey, most of the dominated tree species were found to be Palas (*Butea monosperma*) followed by Char (*Buchanania lanzan*) and Mahua (*Madhuca indica*). The maximum birds nests have been found in the dominated tree species. Red Vented Bulbul and Laughing Dove including their cup shaped nests has been found in these dominant trees. It is observed that most cavity nester bird species were disturbed by deforestation. The diversity of birds and in particular the native species is positively correlated with increasing structural complexity of the vegetation.^[7] Forests attract a large number of birds because they provide suitable habitat for most birds specially those which are associated with vegetation, and for most, the existence of tree is a vital component of their life cycle. The bird's level of interest on various forests depends on the edge of the stands. The composition of bird species is highly related to the vegetation structure of forest.^[7] The highest diversity of birds is in the forest due to the availability of food, water, breeding sites, breeding material and cover from predators, However, most of the birds found in rainy season and then in summer season and winter season. The result of this study concurs with the

findings of the above discussion highlights the challenges to birds' diversity and their habitats, directly or indirectly, affected by deforestation practices in the name of infrastructural development, and land disturbance from construction activities. The survivality of terrestrial as well as aquatic birds is mostly affected by certain factor such as destruction of habitat, cutting of host trees, loss of food etc. Among the study site the dominant family of birds have been Pycnonotidae, Meropidae and Motacillidae, similarly the most dominated tree family have been Fabaceae, Anacardiaceae and Sapotaceae.



Graph No. 1.1: Family wise birds population at study site



Graph No. 1.2 : Comparision between Rainy, Winter, and Summer seasons birds

Table No. 1.1: Checklist of total birds at study site

S.N.	Birds Species	Zoological Name	Family	IUCN Status	Habitat	Rainy Season	Winter Season	Summer Season	Total No. of birds
1.	Red Vented Bulbul	<i>Pycnonotus cafer</i>	Pycnonotidae	LC	R	33	14	32	79
2.	Green Beater	<i>Merops orientalis</i>	Meropidae	LC	R	38	3	15	56
3.	Paddy Field Pipit	<i>Anthus rufulus</i>	Motacillidae	LC	R	13	4	15	32
4.	Laughing Dove	<i>Spilopelia senegalensis</i>	Columbidae	LC	R	15	7	9	31
5.	Spotted Dove	<i>Spilopelia chinensis</i>	Columbidae	LC	R	12	12	5	29
6.	Golden Oriole	<i>Oriolus oriolus</i>	Oriolidae	LC	R	14	6	8	28

7.	Common Myna	<i>Acridotheres tristis</i>	Sturnidae	LC	R	10	6	12	28
8.	Purple Sunbird	<i>Cinnyris asiaticus</i>	Nectariniini	LC	R	8	7	7	22
9.	Black Drongo	<i>Dicrurus macrocercus</i>	Dicruridae	LC	R	9	5	5	19
10.	Caller Dove	<i>streptopelia decaocto</i>	Columbidae	LC	R	5	8	2	15
11.	Baya Beaver	<i>Ploceus philippinus</i>	Ploceidae	LC	R	10	4	-	14
12.	Rose Ringed Parakeet	<i>Psittacula krameri</i>	Psittaculidae	LC	R	6	6	7	19
13.	Ashy Prinia	<i>Prinia socialis</i>	Cisticolidae	LC	R	5	5	1	11
14.	Indian Roller	<i>Coracias benghalensis</i>	Coraciidae	LC	R	9	1	1	11
15.	Copper Smith Barbet	<i>Psilopogon haemacephalus</i>	Megalaimidae	LC	R	5	2	3	10
16.	Indian Robin	<i>Copsychus fulicatus</i>	Muscicapidae	LC	R	6	-	4	10
17.	Horsfield's Bush Lark	<i>Mirafra javanica</i>	Alaudidae	LC	R	2	5	2	9
18.	Wood Peaker	<i>Dryocopus martius</i>	Picidae	LC	R	3	2	3	8
19.	Greater Cauca	<i>Centropus sinensis</i>	Cuculidae	LC	R	2	3	2	7
20.	Scaly Breasted Munia	<i>Lonchura punctulata</i>	Estrildidae	LC	R	3	-	3	6
21.	Common Hoopoe	<i>Upupa epops</i>	Upupidae	LC	R	3	1	2	6
22.	White Rumped Munia	<i>Lonchura striata</i>	Estrildidae	LC	R	3	1	-	4
23.	Plum Headed Parakeet	<i>Psittacula cyanocephala</i>	Psittacidae	LC	R	4	-	-	4
24.	Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	LC	R	1	1	1	3
25.	Shikra	<i>Accipiter badius</i>	Accipitridae	LC	R	1	1	-	2
26.	Indian Silver Bill	<i>Euodice malabarica</i>	Estrildidae	LC	R	2	-	-	2
27.	Little Swift	<i>Apus affinis</i>	Apodidae	LC	R	1	-	-	1
28.	White Rumped Shama	<i>Copsychus malabaricus</i>	Muscicapidae	LC	R	-	1	-	1
Total				223	105	139	467		
Grand Total							467		

Legends: LC= Least Concerned, R= Residence

V. CONCLUSION

The Study analyzed the influence of various factors in the occurrence and distribution of bird communities in the various habitats of Power Grid Transmission Line study area. Continuity and variability of the habitat seems to be the prime factor deciding the bird population in any area. Structural heterogeneity of the habitat decides the composition and richness of the bird community that inhabits it. Plant species diversity and bird diversity are often negatively correlated. It is the stratification of the vegetation that is more important in the avian use of any area. Localities with similar vertical layering of vegetation have similar bird assemblages. Availability of food also seems to determine the local bird diversity. Habitat structure and landscape heterogeneity are not the major influences on the local bird diversity in Power Grid Transmission Line study area. While each habitat can have its own endemic species, the abundance and species diversity of any habitat can be altered under the influence of other factors. Furthermore, species, which fluctuate in abundance independently of others, is being influenced by a different constellation of regulatory factors, not merely the vegetation type. There is a need to protect the habitat structure and diversity present in the study site, as it is important for maintaining the diversity and ecological balance of bird population. Further research on appropriate conservation mechanism and management techniques with the ultimate conservation goal of changing Power Grid study site environments into species rich ecosystems are inevitable. The study underlines the importance of green space ecosystems around the Power Grid as preferred habitats for bird populations. It is needed to develop their alternative habitat for conservation.

Plate No. 1 Glimpses of birds at study site in Power Grid Transmission Line-2



Red Vented Bulbul



Rose Ringed Parakeet



Black Drongo



Power Grid Transmission Line



**Power Grid Transmission Line side
Avifauna survey**



Study site Avifauna survey

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