



Avifaunal Checklist of Bharat Heavy Electrical Limited (BHEL) Campus in Jhansi District, Uttar Pradesh, India

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ABSTRACT

Humans have been always fascinated by birds. The human-bird association is since ancient times and is an intimate one. Birds have always served humans with incalculable services since they are consistent indicators of a healthy ecosystem. India is a home for about 1710 bird species. The estimated bird species on the earth is around 8600. At present the rapid developmental activities are posing threats to a number of bird species directly or indirectly. This study deals with study of feathered bipeds in the residential campus (township) of Bharat Heavy Electricals Limited (BHEL), a second generation plant for the manufacturing of power transformers. BHEL campus supports about 71 bird species belonging to 30 families. This is a preliminary and basic effort to bring out the incredible bird fauna being maintained in the campus of an industrial and developed locomotive industry. It is an excellent example of sustainable development specifically regarding biodiversity of birds.

Key words: Birds, ecosystem, humans, species

1. INTRODUCTION

At present it is estimated that about 8600 bird species inhabit the Planet Earth. Indian Sub-Continent is known to have some 2061 species and subspecies of birds. Of these, 1710 are resident while 300 are migrant and the status of some is unclear (Ali S., 2002). About 176 species are endemic to the Indian subcontinent.

Due to the unsustainable life style of Human beings, there has been an elevated interest in avifauna and its conservation. Avifaunal diversity has been studied in various aspects in Protected Areas, agricultural lands, grasslands, wetlands, mangroves, as well as specific regions according to the habitats. Recently various studies have been done on the bird diversity of university campuses and institutes (Ramitha & Vijayalaxmi 2001; Dookia 2002; Praveen & Joseph 2006, Kanaujia *et al* 2012). This study elaborates about 71 types of birds from 30 families flourishing inside. The checklist comprises of zoological name, common name, local name along with the family, abundance code and IUCN Status according to IUCN Red List of Threatened Species. This study also incorporates some basic undemanding ways to protect these feathered friends in and around humans. This is a preliminary and basic effort to bring out the incredible bird fauna being maintained in the campus of an industrial and developed locomotive industry. It is an excellent example of sustainable development specifically regarding biodiversity of birds. These studies though preliminary, are strong enough to create awareness among the people associated with these institutes.

Study area

This study deals with study of feathered bipeds in the residential campus (township) of Bharat Heavy Electricals Limited (BHEL), a second generation plant for the manufacturing of power transformers. By the end of 5th five-year plan, it was envisaged by the planning commission that the demand for power transformer would rise in the coming years. Anticipating the country's requirement BHEL decided to set up a new plant, which would manufacture power and other types of transformers in addition to the capacity available in BHEL Bhopal. So this unit of Jhansi was established around 14 km from the city on the N.H. No 26 on Jhansi Lalitpur road. It is called second-generation plant of BHEL set up in 1974 at an estimated cost of Rs 16.22 crores inclusive of Rs 2.1 crores for township. Its foundation was laid by late Mrs. Indira Gandhi the Prime Minister on 9th Jan. 1974.

The Township has an area of 5.5 Acres with a population of about 5000 people. It has enriched flora that supports not only rich diversity of avifauna but also Odonates (Dragonflies and Damselflies), Lepidopteron (Butterflies) and Herpetofauna (Reptiles and amphibians). There are a number of well maintained parks in the campus. Besides these every house retain their own gardens. Rich flora includes trees like *Saraca asoca* (Ashok), *Terminalia arjuna* (Arjun), *Syzygium cuminii* (Jamun), *Ficus religiosa* (Peepal), *Ficus benghalensis* (Banyan), *Phyllanthus emblica* (Amala), *Azadirachta indica* (Neem), *Mangifera indica* (Mango), *Jijiphus spina crysti* (Ber), *Tectona grandis* (Teak Tree), *Plumeria rubra* (Temple tree), *Bamboo* (baas), *Aegle marmelos* (Bel), *Artocarpus heterophyllus* (Kuthal), *Calotropis procera* (Madaar), Gulmohar (Delonix regia), Yellow flame tree, Mahua, Palash, *Laburnum x watereri 'Vossii'* (Golden Rain), *Pithecellobium dulce* (Jungle jalebi), *Roystonea regia* (Cuban royal palm), *Psidium guajava* (Guava) and other herbs and shrubs.

2. MATERIALS AND METHODS

In the present study, observations were made throughout the study area for 6 years (2012-2017). The survey was carried out at suitable time (i.e. morning: 06:00 to 10:00 hr and from evening: 16:30 to 18:30 hr in summers while from 7:00 to 11:00 am in morning and 3:00-5:30 pm in evening during the winters) of the day. Observations were carried out with the aid of 10x50 binoculars and field features were noted down on data sheets (Kanaujia *et al.*, 2012). Records were supported with photography using Kodak 12X digital zoom camera and 7D Canon SLR Camera. Birds sighted during the study period were categorized according to their presence (month-wise) status as residents (R) or migrants (M). Identification of birds was done with the help of key reference books (Grewal 2002, Ali S. 2002 and Grimmett *et al.*, 2007).

3. RESULT AND DISCUSSION

During the study time, 71 bird species were identified belonging to 30 families. Among the species observed, 9 i.e. 12.67 % (*Sturnus malabaricus*, *Motacilla cinerea* and *Ficedula parva*) were migrants or local migrants as per Ali and Ripley (1995) and the rest 62 i.e. 87.32% were local birds of which 17 i.e. 23.94% bred in the campus during the study period. The maximum number of bird species was represented by families Corvidae and Passeridae followed by Sylviidae, Sturnidae, Musciapidae and Accipitridae. The most common birds were Myna, babbler, crows, bulbul, Robins, silver bill munias, Indian Roller and parrots, while Indian Grey Hornbill, Plum-headed Parakeet, Collared Scops Owl, Yellow-wattled lapwing, Oriental Honey Buzzard, Common Buzzard, Egyptian vulture, Large Cuckooshrike, and Grey-headed Canary Flycatcher were seen occasionally or rarely. The identified bird species have been

listed (Table 1) following Ali and Ripley (1983) and Bikram Grewal *et al.*, 2011. The photographs of some of the uncommon and fairly common birds listed in table 1 are given in Table 2. This effort indicates that the rich flora of township supports an excellent diversity and number of birds. The preference of trees varied with the bird species. The feeding habits of birds were not studied in detail. Most of the birds were omnivorous, graminivores and insectivorous while few of them were frugivores, scavengers and nectarivores.

Table 1

List of Bird Species in BHEL Township

S.No	Common Name	Zoological Name	Local name	Family	Residential/ migratory	Abundance code
1.	Grey Francolin	<i>Francolinus pondicerianus</i>	Safed teetar	Phasianidae	R	C
2.	Peacock	<i>Pavo cristatus</i>	Mor	Phasianidae	R	C
3.	Black-rumped Flameback	<i>Dinopium benghalense</i>	kathfudwa	Picidae	R	C
4.	Brown-headed barbet	<i>Megalaima zeylanica</i>	Bada basanta	Megalaimidae	R	FC
5.	Coppersmith Barbet	<i>Megalaima haemacephala</i>	Chota basanta	Megalaimidae	R	C
6.	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	Dhanesh	Bucerotidae	R	FC
7.	Common Hoopoe	<i>Upupa epops</i>	Hudhud	Upupidae	R	C
8.	Indian Roller	<i>Coracias benghalensis</i>	Neelkanth	Coraciidae	R	C
9.	Common Kingfisher	<i>Alcedo atthis</i>	Chhota kilkila	Alcedinidae	R	FC
10.	White-throated kingfisher	<i>Halcyon smyrnensis</i>	Kilkila	Halcyonidae	R	C
11.	Green bee-eater	<i>Merops orientalis</i>	Harrial	Meropidae	R	C
12.	Brain-fever bird/ Common Hawk Cuckoo	<i>Hierococcyx varius</i>	Papiya	Cuculidae	R	FC
13.	Asian koel	<i>Eudynamis scolopacea</i>	Koel	Cuculidae	R	C
14.	Greater Coucal	<i>Centropus sinensis</i>	Mahoka	Centropodidae	R	C
15.	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Tota	Psittacidae	R	C
16.	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	Tuiya Tota	Psittacidae	R	FC
17.	House Swift	<i>Apus affinis</i>	Ababeel	Apodidae	R	C
18.	Collared Scops Owl	<i>Otus bakkamoena</i>	***	Strigidae	R	FC
19.	Jungle Owlet	<i>Glaucidium radiatum</i>	Jangli choghad	Strigidae	R	FC
20.	Rock Pigeon	<i>Columba livia</i>	Kabutar	Columbidae	R	C
21.	Laughing dove	<i>Streptopelia senegalensis</i>	Chhota fakta	Columbidae	R	C
22.	Spotted dove	<i>Streptopelia chinensis</i>	Chitroka fakhta	Columbidae	R	C
23.	Eurasian collared dove	<i>Streptopelia decaocto</i>	Panduk	Columbidae	R	C

24.	White-breasted waterhen	<i>Amaurornis phoenicurus</i>	Dauk, Dawak	Rallidae	R	C
25.	Red-wattled lapwing	<i>Vanellus indicus</i>	Titeeri	Charadriidae	R	C
26.	Yellow-wattled lapwing	<i>Vanellus malabaricus</i>	Zirdi	Charadriidae	R	UC
27.	Black-shouldered kite	<i>Elanus caeruleus</i>	Kapassi	Accipitridae	R	FC
28.	Oriental Honey Buzzard	<i>Pernis ptilorhynchus</i>	Madkare	Accipitridae	R	FC
29.	Common Buzzard	<i>Buteo buteo</i>	Chuhamar	Accipitridae	M	UC
30.	Egyptian vulture	<i>Neophron percnopterus</i>	Gobar Giddh	Accipitridae	R	UC
31.	Shikra	<i>Accipiter badius</i>	Chipka	Accipitridae	R	C
32.	Cattle egret	<i>Bubulcus ibis</i>	Surkhia bagla	Ardeidae	R	C
33.	Indian pond heron	<i>Ardeola grayii</i>	Andha Bagla	Ardeidae	R	C
34.	Long-tailed Shrike	<i>Lanius schach</i>	Kajala latora	Laniidae	R	C
35.	Rufous Treepie	<i>Dendrocitta vagabunda</i>	Mahalat	Corvidae	R	C
36.	House crow	<i>Corvus splendens</i>	Kowwa	Corvidae	R	C
37.	Jungle crow	<i>Corvus macrorhynchos</i>	Kala kowwa	Corvidae	R	C
38.	Eurasian Golden Oriole	<i>Oriolus oriolus</i>	Peelak	Corvidae	R	C
39.	Black drongo	<i>Dicrurus macrocerus</i>	Bhujanga	Corvidae	R	C
40.	Ashy Drongo	<i>Dicrurus leucophaeus</i>	Bhujanga	Corvidae	M	FC
41.	Common lora	<i>Aegithina tiphia</i>	Shaubeegi	Corvidae	R	FC
42.	Large Cuckooshrike	<i>Coracina macei</i>	Kasya	Corvidae	R	UC
43.	Grey-headed Canary Flycatcher	<i>Culicicapa ceylonensis</i>	Zard-phutki	Musciapidae	M	FC
44.	Oriental Magpie Robin	<i>Copsychus saularis</i>	Dhaiyar	Musciapidae	R	C
45.	Indian Robin	<i>Saxicoloides fulicata</i>	kalchuri	Musciapidae	R	C
46.	Common Stonechat	<i>Saxicola torquata</i>	***	Musciapidae	M	C
47.	Black Redstart	<i>Phoenicurus ochruros</i>	Thirthira	Musciapidae	M	FC
48.	Brahminy Starling	<i>Sturnus pagodarum</i>	Brahmini myna	Sturnidae	R	C
49.	Asian pied starling	<i>Sturnus contra</i>	Ablak myna	Sturnidae	R	C
50.	Common Mynah	<i>Acridotheres tristis</i>	Desi myna	Sturnidae	R	C
51.	Bank Mynah	<i>Acridotheres ginginianus</i>	Ganga myna	Sturnidae	R	C
52.	Great Tit	<i>Parus major</i>	Ramgangra	Paridae	R	FC
53.	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Bulbul	Pycnonotidae	R	C
54.	Zitting Cisticola	<i>Cisticola juncidis</i>	Ghas-ki-pitpiti	Cisticolidae	R	FC
55.	Jungle Prinia	<i>Prinia sylvatica</i>	Tot-rungi	Cisticolidae	R	FC
56.	Ashy Prinia	<i>Prinia socialis</i>	Kali phutki	Cisticolidae	R	C
57.	Plain Prinia	<i>Prinia inornata</i>	Phutki	Cisticolidae	R	C
58.	Oriental White-eye	<i>Zosterops palpebrosus</i>	Baboona	Zosteropidae	R	C
59.	Common Tailorbird	<i>Orthotomus sutorius</i>	Darzee	Sylviidae	R	C

60.	Yellow eyed babbler	<i>Chrysomma sinense</i>	Gulab-chasm	Sylviidae	R	C
61.	Large Grey Babbler	<i>Turdoides malcolmi</i>	Sat bhaina	Sylviidae	R	C
62.	Jungle Babbler	<i>Turdoides striatus</i>	Sat bhai	Sylviidae	R	C
63.	Common Chiffchaff/Brown Leaf Warbler	<i>Phylloscopus collybita</i>	***	Sylviidae	M	C
64.	Purple Sunbird	<i>Nectarinia asiatica</i>	Phul soohgni	Nectariniidae	R	C
65.	House Sparrow	<i>Passer domesticus</i>	Gauriya	Passeridae	R	C
66.	White Wagtail	<i>Motacilla dukhunensis</i>	***	Passeridae	M	C
67.	Grey Wagtail	<i>Motacilla cinerea</i>	***	Passeridae	M	FC
68.	White-browed Wagtail	<i>Motacilla maderaspatensis</i>	Khanjan	Passeridae	M	FC
69.	Indian Silverbill	<i>Lonchura Malabarica</i>	Pidda	Passeridae	R	C
70.	Scaly-breasted Munia	<i>Lonchura punctulata</i>	Seenabaz	Passeridae	R	FC
71.	Baya Weaver	<i>Ploceus philippinus</i>	Baya/son chiri	Passeridae	R	C

***: Not Available; R-residential; M-migratory; C-common; FC-fairly common; UC-Uncommon

Table 2

Photographs of Some of the Uncommon and Fairly Common birds



Brown-headed barbet
Megalaima zeylanica



Yellow-wattled lapwing
Vanellus malabaricus



Common Kingfisher
Alcedo atthis



Plum-headed Parakeet
Psittacula cyanocephala



Brain-fever bird
Hierococcyx varius



Indian Grey Hornbill
Ocyrceros birostris



Collared Scops Owl
Otus bakkamoena



Jungle Owlet
Glaucidium radiatum



Egyptian vulture
Neophron percnopterus



Common Iora *Aegithina tiphia*



Common Buzzard *Buteo buteo*



Large Cuckooshrike *Coracina macei*



Grey-headed Canary Flycatcher
Culicicapa ceylonensis



Black Redstart *Phoenicurus ochruros*



Great Tit *Parus major*



Grey Wagtail *Motacilla cinerea*



White-browed Wagtail
Motacilla maderaspatensis



Scaly-breasted Munia *Lonchura punctulata*

Table 3

Birds feeding in the campus

**House Sparrows****Silver-bill munia****Babbler****Bulbul****Purple sunbird****Rose-ringed Parakeet****Brahminy myna****woodpecker**

Table 4

Birds drinking water from clay pots in gardens



Indian Robin



Oriental-white eye



Common Myna



Rose-ringed parakeet



Woodpecker



House Sparrow



Sunbird from cooler



Female koel



Shikara from water in pitch



Brahminy Myna



Drongo



Oriental-Robin



Male Koel



Babbler



House Sparrow and Robin in Wooden Nest Boxes



House Sparrows in earthen pot as nest

Some basic undemanding ways to protect feathered friends in and around humans

1. **Feed the Birds:** Keep out food for birds regularly so as to reduce the amount of energy they have to spend searching for food (table 3). Birds can be fed on a wide range of food, such as grains (bajara, kakun) rice, seeds, nuts, cheese, dried fruit, fresh fruit and kitchen scraps. One way to feed birds is to put food on a bird table, which can be just a simple tray fixed to a post or suspended from a tree. Hanging half a coconut from a tree is a simple way to feed birds that can cling to the rim and feed on the nutritious white coconut inside. Lawns are good for birds that eat ants and worms. Birds also feed on seeds of certain flowers such as sunflowers. Do not use pesticides and insecticides in your garden. Do not provided salted food items to birds.
2. **Water for birds:** during summers there is scarcity of water for animals and birds that results in dehydration. Many of them are unable to cope up with high temperatures and die. As such they are depended on humans to provide them water. This can be done by using clay bowls with a depth of around 3-4 inches (table 4). Birds also take in water from coolers as well as natural water bodies. Water does not get heated up even at high temperatures (40-42 degrees Celsius) in Clay bowls as in plastic or metal bowls.
3. **Bird House:** Due to changing human life styles there has been reduction in the nesting sites of many birds an example of this is the House Sparrow (Kanaujia *et al.*, 2014). For this predicament Nest boxes are supportive. They can be made of different materials for almost all birds. The entrance hole of nest box varies with the size of bird. They should be placed in a direction away from direct sunlight and beyond the reach of predators. A nest box is ideal for bird watching too.

4. CONCLUSION

By the magnificence of their plumage and the attractiveness of their forms, by the chirpiness of their movements and the charm of their songs, birds epitomize Life and Beauty. This is a preliminary and basic effort to bring out the incredible bird fauna being maintained in the campus of an industrial and developed locomotive industry. It is an excellent example of sustainable development

specifically regarding biodiversity of birds. The present observational study on avian diversity of BHEL Township Campus is an endeavour to draw the consideration of all associated with the Industry. The intention is to be acquainted with and then improve and maintain the avifauna with slight concern such as providing bird feed, water, and bird houses for these amazing friends. The campus is already well maintained and ideal for that support the residing birds. However an additional study on the feeding habits and nesting patterns of the birds will enhance the fauna.

SUMMARY OF RESEARCH

- Birds play a noteworthy function in ecosystem. Birds are an imperative component of biodiversity and their occurrence and distribution are an important phenomenon to understand the overall picture of a habitat. This is a preliminary and basic effort to bring out the incredible bird fauna being maintained in the campus of an industrial and developed locomotive industry. It is an excellent example of sustainable development specifically regarding biodiversity of birds.
- During the study time, 71 bird species were identified belonging to 30 families. Among the species observed, 9 i.e. 12.67 % (*Sturnus malabaricus*, *Motacilla cinerea* and *Ficedula parva*) were migrants or local migrants and the rest 62 i.e. 87.32% were local birds of which 17 i.e. 23.94% bred in the campus.
- The maximum number of bird species was represented by families Corvidae and Passeridae followed by Sylviidae, Sturnidae, Musciapidae and Accipitridae. The most common birds were Myna, babbler, crows, bulbul, Robins, silver bill munias, Indian Roller and parrots.
- This is a preliminary and basic effort to bring out the incredible bird fauna being maintained in the campus of an industrial and developed locomotive industry. It is an excellent example of sustainable development specifically regarding biodiversity of birds.
- The present observational study on avian diversity of BHEL Township Campus is an endeavour to draw the consideration of all associated with the Industry. The intention is to be acquainted with and then improve and maintain the avifauna with slight concern such as providing bird feed, water, and bird houses for these amazing friends. The campus is already well maintained and ideal for that support the residing birds.

FUTURE ISSUES

BHEL campus has a rich avian diversity including many uncommon birds as well as many species of raptors. There are no threats to this breathtaking avian diversity. However the detail study on feeding and nesting behaviour of various bird species will enhance the population of the dwelling birds and maintain the healthy ecosystem for the future.

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Conflict of Interest: The authors declare that there are no conflicts of interests.

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