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### Avifaunal diversity in an IBA site of north east India and their conservation

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#### ABSTRACT

*The present study aims to estimate the avifaunal diversity of Bordoibam Bilmukh bird sanctuary, a nationally important IBA site of NE region of India during August 2009 to July 2010. A total of 133 species of birds belonging to 41 families have been recorded, of which 86 (64.7%), 23 (17.3%) 24 (18%) species were resident, migratory and, local mover. Conservation programmes on the wetland and avifaunal diversity in the bird sanctuary should be formulated for all kinds of avifauna.*

**Key words:** Avifauna, bird sanctuary, IBA-site, NE India.

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#### INTRODUCTION

Northeast India, a mega-biodiversity centre and a hotspot[1], comprises eight states, viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. It occupies 7.7% of India's total geographical area supporting 50% of the flora (ca. 8000 species) [2], of which 31.58% (ca. 2526 species) is endemic [3]. It is a transitional zone between the Indian, Indo-Burman–Malaysian and Indo-Chinese regions. The region has four biosphere reserves, 48 sanctuaries, 14 national parks, and two world heritage sites. But lack of awareness at the grassroots level hampers the process of biodiversity conservation [4]. About 958 species and sub-species of birds have so far been documented or are likely to occur in Assam. Some 280 are winter migrants from northern latitude [5]. As large scale changes have been taking place in the natural habitats of birds, research at community level of birds in the Indian sub-continent is essential [6].

Assam government declared Bordoibam bilmukh wetland as Bird Sanctuary in the year 1996 vide Government notification no Pre.FRW-15/96/3-A on 3<sup>rd</sup> of July. But no scientific study of

this wetland has been made. Hence, the objective of the present study is to assess the avifaunal diversity of Bordoibam Bilmukh bird sanctuary, which is expected to be helpful in designing a plan for the conservation and sustainable management of the IBA site.

## MATERIALS AND METHODS

### Study Area:

#### a) Location:

Bordoibam Bilmukh bird sanctuary ( an IBA-site of North Eastern India, code-AS07) is a riparian wetland located just 50 km away from the district headquarter of Lakhimpur district of Assam and about 455 km from the state capital Dispur, Guwahati. Geographically it is located in between 27.20N (Latitude) and 94.20E (Longitude) respectively. This wetland is no doubt a larger riparian wetland in the Dhemaji and Lakhimpur district of Assam. The wetland is commonly called as '*Bordoi Pakhi Udyan*' by the communities resided around it. This riverine origin wetland situated in the northern boundary of the mighty river Brahmaputra. The wetland has a link with river Champara, a tributary of the river Brahmaputra flowing in the north-eastern boundary of the IBA site particularly during peak monsoon months. Two inlets namely Nandisuti and Tengagarhjan have made a connection with the wetlands during summer and monsoon. Bordoibam Bilmukh bird sanctuary covers an area of 1124.78 hectares i.e. 11.25 km square. Dhakuakhana and Gugamukh linked state PWD road and a crop field in the north, *Bilmukh* and *Medak* village in the south; *Mazigaon*, *Tengagarh*, *Bordoi napam* village in the east and the village villages' like-*Adut*, *Kaltalia*, *Kathalguri* in the west. Survey was made in a monthly basis for a period of one year from August 2009 to July 2010. Observations were made within the total IBA site i.e. 11.25 km square area and few villages very closer to the IBA-site by using a 8x30 prism (Russian) binoculars systematically walked routes through the study area. The time schedule selected for the study was from 0700 hr to 1000 hr in the morning and 1400 hr to 1600 hr in the afternoon. The entire study area was divided into six segments viz. - Residential Area (RA), Grassland Area (GA), Fragmented Jungles (FJ), Shallow Water Zone (SW), Core Area (CA) and Overhead Flight (OF). The characteristics of birds were noted down on ornithological data sheet. Recorded species were identified with the help of standard literature [5, 7,8,9,10]

## RESULTS AND DISCUSSION

Systematic list with some other details of recorded birds of the study area are summarized in the Table: 1. In the present study altogether 133 species of birds belonging to 41 families have been recorded, of which 86 (64.7%) species were resident, 23 (17.3%) were migratory and 24 (18%) were local movement. So far the bird species abundance was concerned, out of 133 species 36 (27.1%) abundant, 62 (46.6%) normal and 35 (26.3%) species were recorded as rare. Percentage of feeding habit, birds in different habitat combinations, percentage of different category of birds, no of species and group of bird families are depicted in Figure:1, 2,3 and 4 respectively.

Several bird species have used different habitat combinations in the study area; viz. 8 (6.01%) species used shallow water zone (SW) and core area (CA); 3 (2.25%) species utilized fragmented jungles (FJ), shallow water zone (SW) and core area (CA); 4 (3%) species used grassland area (GA), fragmented jungles (FJ) and shallow water zone (SW); 2 (1.5%) species used only shallow

water zone (SW); 5 (3.75%) species utilized residential area (RA), grassland area (GA), fragmented jungles (FJ), shallow water zone (SW) and core area (CA); 1(0.75%) species utilized residential area (RA), grassland area (GA) and water zone (SW); 9 (6.76%) species utilized residential area (RA), grassland area (GA), fragmented jungles (FJ) and shallow water zone (SW); 46 (34.58%) species used residential area (RA), grassland area (GA) and fragmented jungles (FJ); 11 (8.27%) species used, grassland area (GA), fragmented jungles (FJ) and shallow water zone (SW) and core area (CA); 1 (0.75%) species utilized grassland area (GA) and shallow water zone (SW); 3 (2.25%) species used grassland area (GA), shallow water zone (SW) and core area (CA); 8 (6.01%) species were observed overhead flight condition (OF); 10 (7.51%) species were observed in fragmented jungles (FJ) and overhead flight condition (OF); 7 (5.26%) species have found in residential area (RA), grassland area (GA) fragmented jungles (FJ) and overhead flight condition (OF); 5 (3.75%) species used grassland area (GA) and fragmented jungles (FJ); 4 (3%) species used fragmented jungles (FJ) only; 6 (4.51%) species used residential area (RA), and fragmented jungles (FJ) and 1 (0.75%) species used residential area (RA) and grassland area (GA).

Feeding habit of each species depicted in the Table-1 which are divided into seven groups viz.- granivorous and frugivorous 3 sp.(2.25%); fish eating 4 sp.(3%); carrion 3 sp.(2.25%); omnivorous 50 sp.(37.59%); frugivorous 3 sp.(2.25%); granivorous 6 sp.(4.51%); herbivorous 4 sp.(3%); carnivorous 49 sp.(36.84%) and insectivorous 11 sp.(8.27%). Competition for food has been found negligible because of their diverse preferential habitat, feeding behaviour and more importantly the availability of foodstuff.

Birds like *Palecanus phillipensis*, *Anhinga melanogaster*, *Mycteria leucocephala* and *Ichthyophaga ichthyaetus* were listed as near threatened in BLI-2008 report. These birds were more or less common in the wetland. Endangered bird like *Leptoptilos dubius* was rarely observed in the wetland. *Sarcogyps calvus* and *Gyps bengalensis* were listed as critically endangered and have rarely observed in the study area.

Presence of 133 bird species in the Bordoibambilmukh sanctuary indicates that the area is able to give ecological security to the wetland dependent birds by providing quantities of food in the form of microflora (aquatic planktonic species), mesoflora (aquatic vegetations), microfauna (small microscopic animals), mesofauna (fishes, insects and small animals) etc in the wetlands. Although, the IBA-site is inadequately protected [5] but avian diversity was certainly high. In the studied IBA-site maximum aggregation of aquatic birds was observed during morning hours of winter months. *Anser indicus*, *Anser anser*, *Tadorna ferruginea*, *Anas acuta*, *Anas crecca*, *Anas platyrhynchos*, *Anas poecilorhyncha*, *Aythya fuligula*, *Anas strepera*, *Tringa stagnatilis*, *Tringa glareola*, *Mycteria leucocephala*, *Anthus hodgsoni*, *Dendronanthus indicus*, *Motacilla flava*, *Motacilla cinerea*, *Motacilla alba* etc. were the migratory birds recorded in the IBA-site. These species travel from their native breeding grounds to escape from their unfavorable period in a more suitable place, like Bordoibam Bilmukh Bird sanctuary where foods and other needs are plentiful. Many of the winter migrants usually came from Palearctic region or Eurasia, France etc. In winter, the migration route of numerous aquatic bird species takes them by the floodplain wetlands, and many stop there for a breather. After having rested and eaten, they resume their journey to their nesting grounds elsewhere [11].

Many waterfowl species as well as muskrats and beaver consume the seeds or the tubers (an underground storage organ) of wetlands plants. More importantly, much of the plant material enters the food chain as detritus. Detritus are small plant particles resulting from the breakdown and decomposition of the plants and are subsequently consumed by various organisms such as invertebrates which are then consumed by fish and wildlife. A variety of organisms also use plants as cover or habitat. Several species of aquatic residential birds, such as purple moorhen, white breasted water hen, jackana, varieties of herons etc. are known to nest and raise their young in the riparian wetlands. Seasonal channels dry out leaving muddy puddles and cut-off pools which provide feeding opportunities for large (storks), medium (herons) and small (sandpipers) avifauna. As water levels begin to rise in May & June, many small fish move in to the freshly inundated areas. Kingfishers, cormorants, and Darter were seen feeding within areas. There was a good ecological consumerist relationship established in between fishes and birds of the IBA-site. Therefore, the fishes and birds have occupied different trophic levels. A sound food chain or food web depends on the position and abundance of these two groups of heterotrops in the ecosystem. The mixed fragmented jungle which also contains woodland along with residential area and grassland supports a comparatively higher number of species than other habitat combinations because of mixed jungle was structurally quite different from other types. Structural complexity of the studied habitat could be the main factor in controlling of the bird species diversity.

A good number of colonies of Open-billed stork (*Anastomus oscitans*) were observed in the nearby fragmented jungles of the locality. Together with the nests of Open-billed stork, Lesser Adjutant stork (*Leptoptilos javanicus*) has also constructed the nest. The largest Open-billed stork colony of Dhakuakhana sub-division of Lakhimpur district of Assam was witnessed at the famous Sri Sri Basudev temple situated about 12 K.M away from the IBA-site. The colony lasted for a few months, generally from June to February of each year.

Present study also reveals that the wetland has been facing some danger so far the habitat and its overall biodiversity is concerned. Therefore, some steps are urgently needed to minimize the risk of total deterioration of the riparian wetland bird sanctuary i.e. the IBA-site. For mitigating the above degradation the following steps are suggested.

- Proper documentation of biodiversity of the wetland bird sanctuary should be encouraged.
- Massive awareness programmes should be launched among wetland users and other common peoples to educate them about the negative effects of wetland degradation and depletion of its biodiversity.
- People's participation is utmost necessary for meaningful conservation of wetland bird sanctuary and its biodiversity.
- Government should take initiative for the conservation of the IBA site.

Table1: Systematic list with some other details of recorded birds of the study area

Scientific name	English name	Local name	Abundance	Status	Feeding habit	Habitat	BLI-08
<b>Phasianidae:</b>							
<i>Coturnix coturnix</i>	Common Quail	Botacharai	+++	R	OM	2,3	c
<i>Gallus gallus</i>	Red Jungle Fowl	Bonkukura	+	R	OM	3	r
<b>Anatidae:</b>							
<i>Anser indicus</i>	Bar-headed Goose	Dhritaraj	++	WM	HB	2,3,4,5	c
<i>Anser anser</i>	Grey-leg Goose	Dewraj hanh	++	WM	HB	2,3,4,5	c
<i>Dendrocygna javanica</i>	Lesser Whistling Duck	Sorali	+++	LM	OM	2,3,4,5	c
<i>Dendrocygna bicolor</i>	Large Whistling Duck	Borsarali	+++	LM	OM	2,3,4,5	r
<i>Tadorna ferruginea</i>	Brahminy Duck	Chakoi chakua	+	WM	OM	2,4	c
<i>Anas acuta</i>	Northern Pintail	Dighalnej	++	WM	HB	2,4,5	c
<i>Netapus cormandelianus</i>	Cotton Teal	Gheela hanh	++	R	OM	2,3,4,5	c
<i>Anas crecca</i>	Common Teal	Kalimurihanh	++	WM	HB	2,3,4,5	c
<i>Anas platyrhynchos</i>	Mallard	Amrolia hanh	++	WM	OM	2,3,4,5	c
<i>Anas poecilorhyncha</i>	Spot-billed Duck	Bormugihanh	++	WM	OM	2,3,4,5	c
<i>Aythya fuligula</i>	Tufted Pochad	Bamuni hanh	+	WM	OM	2,3,4,5	c
<i>Anas strepera</i>	Gadwall	Sarumugi hanh	++	WM	OM	4,5	c
<i>Anas clypeata</i>	Northern Shoveller	Khantia hanh	++	WM	CU	4,5	c
<b>Picidae :</b>							
<i>Dinopium javanense</i>	Golden- backed Wood Peaker	RongaMuriaBahaituka	++	R	IN	1,2,3	r
<i>Dinopium benghalense</i>	Les.Gold-backed Wood.Peaker	Sun Bahaituka	++	R	IN	1,2,3	r
<i>Chrysocolaptes festivus</i>	Black shouldered Wood Peaker	Bahaituka	++	R	IN	1,2,3	r
<b>Megalaimidae :</b>							
<i>Megalaima asiatica</i>	Blue throated Barbet	Neelkantha	+++	R	OM	1,2,3	c
<i>Megalaima lineata</i>	Lineated Barbet	Hetuluka	+++	R	OM	1,2,3	c
<b>Upupidae:</b>							
<i>Upupa epops</i>	Common Hoopoe	Kakoisira	++	LM	CU	1,2,3	c
<b>Coraciidae :</b>							
<i>Coracias benghalensis</i>	Indian Roller	Kanwcharai	+++	R	CU	1,2,3	c
<b>Alcedinidae :</b>							
<i>Alcedo atthis</i>	Small blue Kingfisher	Nilamachruka	+++	R	CU	3,6	c
<b>Dacelonidae</b>							
<i>Halcyon capensis</i>	Stork-billed Kingfisher	Hanumanta	++	R	CU	3,6	c
<i>Halcyon smyrnensis</i>	White-breasted Kingfisher	Boga bukur Machruka	+++	R	CU	3,6	c
<b>Cerylidae:</b>							
<i>Ceryle rudis</i>	Lesser pied Kingfisher	Pakhara Machruka	+++	R	CU	3,6	c
<b>Meropidae:</b>							
<i>Nyctyornis athertoni</i>	Blue-beared Bee-eater	Neela Pakhikhowa	++	R	OM	1,2,3	r
<i>Merops philippinus</i>	Blue-tailed Bee-eater	Jeeakhati	+	R	CU	1,2,3	c
<b>Cuculidae:</b>							
<i>Hierococcyx varius</i>	Brainfever bird	Keteki	++	R	OM	1,2,3	c
<i>Cuculus micropterus</i>	Indian Cuckoo	Keteki	++	R	OM	1,2,3	c
<i>Eudynamys scolopacea</i>	Asian Koel	Kuli	+++	LM	OM	1,3	c
<b>Psittacidae :</b>							
<i>Psittacula eupatria</i>	Alexandrine Parakeet	Pahari Bhatow	+	LM	GR,FR	3	c
<i>Psittacula krameri</i>	Rose-ringed parakeet	Galmonika	+	LM	GR,FR	3	c

<i>Loriculus vernalis</i>	Indian hanging Parrot	Ronganejia	+	LM	GR,FR	3	c
<b>Apodidae:</b>							
<i>Cypsiurus balasiensis</i>	Asian Palm-Swift	Tal Botahi	++	R	CU	3,6	c
<b>Tytonidae:</b>							
<i>Tyto alba</i>	Barn Owl	Lakshi Fenchia	+	R	CU	1,2,3	c
<b>Strigidae:</b>							
<i>Athene brama</i>	Spotted Owlet	Kurulia Fenchia	+	R	CU	1,2,3	c
<b>Caprimulgidae:</b>							
<i>Caprimulgus asiaticus</i>	Common Indian Nightjar	Dinkana	++	R	CU	2,3	c
<b>Columbidae :</b>							
<i>Treron phoenicoptera</i>	Yellow-legged green Pigeon	Bor-Haitha	++	R	FR	1,3	c
<i>Ducula aenea</i>	Green Imperial Pigeon	Porghuma	++	R	FR	1,3	c
<i>Treron bicincta</i>	Orange-breasted Green Pigeon	Haitha	+++	R	FR	1,3	c
<i>Streptopelia chinensis</i>	Spotted Dove	Pati Kopow	+++	R	GR	1,2,3	c
<i>S. tranquebarica</i>	Red-Collared Dove	Harua Kopow	+	LM	GR	2,3	c
<i>Chalcophaps indica</i>	Emerald or Bronzwing Dove	Sil Kopow	+	R	GR	2,3	c
<b>Rallidae:</b>							
<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	Dawk	+++	R	OM	1,2,3,4,5	c
<i>Gallinula chloropus</i>	Common Moorhen	Panidawk	++	R	OM	2,3,4,5	c
<i>Porphyrio porphyrio</i>	Purple Moorhen	Kamcharai	++	R	OM	2,4,5	c
<i>Gallicrex cinerea</i>	Water Cock	Kutum charai	++	R	OM	2,4,5	r
<b>Scolopacidae:</b>							
<i>Tringa stagnatilis</i>							
<i>Tringa glareola</i>	Marsh Sand-Piper	Lorioti	++	WM	CU	2,3,4	c
<b>Jacaniidae :</b>							
<i>Metopidius indicus</i>	Wood Sand-piper	Borbali bagua	+	WM	CU	2,3,4	c
<i>Hydrophasianus chirurgus</i>	Bronze-winged Jacana	Dolpunga	+++	R	OM	4,5	c
<b>Charadiidae :</b>							
<i>Vanellus indicus</i>	Pheasant-tailed Jacana	Dolmora	+++	R	OM	4,5	c
<b>Laridae:</b>							
<i>Larus brunicephalus</i>	Red-wattled Lapwing	Balighora	+++	R	CU	1,2,3	c
<i>Sterna aurantia</i>	Brown headed Gull	Rampara	+	WM	OM	2,3,4,5	c
<b>Accipitridae :</b>							
<i>Milvus migrans</i>	Indian River Tern	Ganga Chilani	+	R	CU	6	c
<i>Elanus caeruleus</i>	Black Kite	Muga Charai	+	R	CU	6	c
<i>Haliastur indus</i>	Black-shouldered Kite	Alashi Chilani	+	R	CU	6	c
<i>Accipiter badis</i>	Brahmini Kite	Ronga Chilani	+	LM	CU	6	r
<i>Haliaeetus leucoryphus</i>	Shikra	Borisen	++	R	CU	6	c
<i>Ichthyophaga ichthyactes</i>	Pallase fishing Eagle	Kurua	+	LM	CU	3,6	VU
<i>Circus aeruginosus</i>	Grey headed fishing Eagle	Ukah	++	LM	CU	3,6	NT
<i>Spilornis cheela</i>	Western Marsh Harrier	Dobasen	+	WM	CU	6	c
<i>Sarcogyps calvus</i>	Crested serpent Eagle	Borchorai	+	R	CU	3,6	c
<i>Gyps fulvus</i>	Red-headed vulture	Rajasagun	+	LM	Ca	1,2,3,6	CrEN
<i>Gyps bengalensis</i>	Eurasian Griffon	Borsagun	+	WM	Ca	1,2,3,6	r
<i>Falco peregrinus</i>	Indian white-backed Vulture	Patisagun	++	R	Ca	1,2,3,6	CrEN
<i>Falco chicquera</i>	Shahin Falcon	Sen	++	R	CU	6	r
<b>Podicipedidae:</b>							
<i>Tachybaptus ruficollis</i>	Red headed Falcon	Rongamuria Sen	+	R	CU	6	r
<i>Podiceps cristatus</i>							
<b>Anhinga:</b>							
<i>Anhinga melanogaster</i>	Little Grebe	Panidubi	+++	R	IN	4,5	c
	Great-crested Grebe	Shiva-Hanh	++	WM	CU	4,5	c

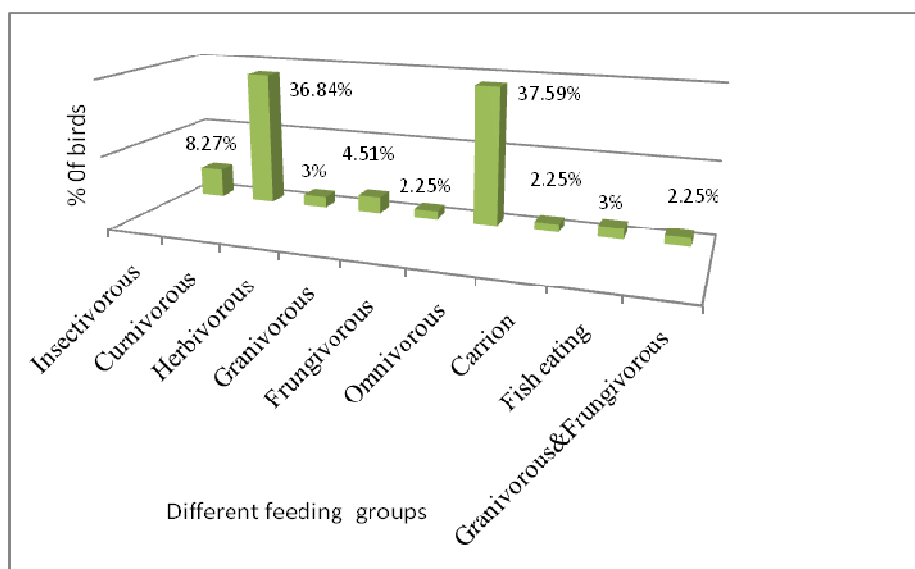


<b>Phalacrocoracidae :</b> <i>Phalacrocorax niger</i> <i>Phalacrocorax carbo</i> <i>Phalacrocorax fuscicollis</i>	Darter or snake Bird	Moniori or Sapcharai	++	LM	FE	3,4,5	NT
<b>Ardeidae :</b> <i>Casmerodius albus</i> <i>Ardea purpurea</i> <i>Bubulcus ibis</i> <i>Egretta garzetta</i> <i>Mesophayx intermedia</i> <i>Nycticorax nycticorax</i> <i>Ardeola bacchus</i> <i>Ardeola grayii</i> <i>Ixobrychus cinnamomeus</i>	Little Cormorant Great Cormorant Indian Shag  Large Egret Purple Heron Cattle Egret Little Egret Median Egret Black-crowned Night Heron Chinese pond Heron Indian Pond Heron Chestnut Bittern	Panikawri Doikola Koilangi  Borbog Ajan Goo Bog Bamun Bogolee Pani Bogolee Wak Charai Konamuchari Konamuchari Itaguria	+++ + +++  +++ ++ +++ ++ ++ +++ +++	R LM LM  LM R R R R R R	FE FE FE  CU CU CU CU CU CU CU	4,5 3,4,5 3,4,5  2,3,4 4 1,2,3,4 1,2,3 1,2,3,4 1,2,3,4,5 1,2,3,4,5 1,2,3,4,5 1,2,3,4,5	c c r  c c c c c c r c c
<b>Threskiornithidae</b> <i>Pseudibis papillosa</i>							
<b>Pelecanidae :</b> <i>Pelecanus philippensis</i>	Black Ibis	Kala Akohibog	+	LM	OM	4	r
<b>Ciconnidae:</b> <i>Anastomus oscitans</i> <i>Mycteria leucocephala</i> <i>Leptoptilos javanicus</i> <i>Leptoptilos dubius</i> <i>Ciconia episcopus</i>	Spotbilled Pelican  Openbilled Stork Painted Stork Lesser Adjutant Stork Greater Adjutant Stork White-necked Stork	Dhera  Samukvonga Rupahi Sareng Bortukula Hargila Kanua	++  +++ + ++ + +	LM  R WM R LM LM	CU  CU CU CU CU CU	4,5  1,2,3,4 1,2,3 1,2,3,4 1,2,3,4 2,3,4	NT  c NT VU EN c
<b>Laniidae :</b> <i>Lanius schach</i> <i>Lanius cristatus</i>							
<b>Corvidae :</b> <i>Oriolus xanthornus</i> <i>Dicrurus macrocercus</i> <i>Dicrurus paradiseus</i> <i>Dendrocitta vagabunda</i> <i>Corvus splendens</i> <i>Corvus macrorhynchos</i> <i>Terpsiphone paradise</i> <i>Aegithina tipkia</i>	Long-tailed Shrike Brown Shrike  Black-headed Oriole Black Drongo Racket-tailed Drongo Indian Tree Pie House Crow Jungle Crow Asian Paradise Flycatcher Common Iora	Kola chetcheti Dighalnejji  Sakhiati Phensu Bheemraj Koklonga Patikaori Dhorakaori Barisundari Bihuti Charai	++ ++  ++ ++ + ++ +++ ++ + +	R WM  LM R R R R R R R	CU CU  OM OM OM OM OM IN CU	1,2,3 1,2,3  1,2,3 1,2,3,6 1,2,3,6 1,2,3 1,2,3,6 1,2,3,6 1,2,3 1,2,3	c c  c c c c c r c
<b>Muscicapidae :</b> <i>Rhipidura aureola</i> <i>Rhipidura albicollis</i> <i>Orthotomus sutorius</i> <i>Copsychus saularis</i> <i>Copsychus malabaricus</i>	White-brow Fantail Flycatcher White-throat Fantail Flycatcher Common Tailor Bird Magpie Robin White-rumped Shyama	Nachani Nachani Patsira or Tipachi Dohikotora Shyama	++ + ++ +++ ++	R R R LM R	IN IN OM OM IN	1,2,3 1,2,3 1,2,3 1,2,3 1,2,3	r c c c c
<b>Sturnidae :</b> <i>Sturnus contra</i> <i>Acridotheres ginginianus</i> <i>Acridotheres fuscus</i> <i>Acridotheres tristis</i>							
<b>Paridae</b> <i>Parus major</i>	Asian Pied Starling Bank Myna Jungle Myna Common Myna	Kankurika Matisalika Chutia salika Ghor salika	++ ++ +++ +++	R R R R	OM OM OM OM	1,2,3 1,2,3 1,2,3 1,2,3	c c c c
<b>Hirundinidae :</b> <i>Hirundo rustica</i>	Great Tit	Bhadarkoli	+++	R	OM	1,2,3	c

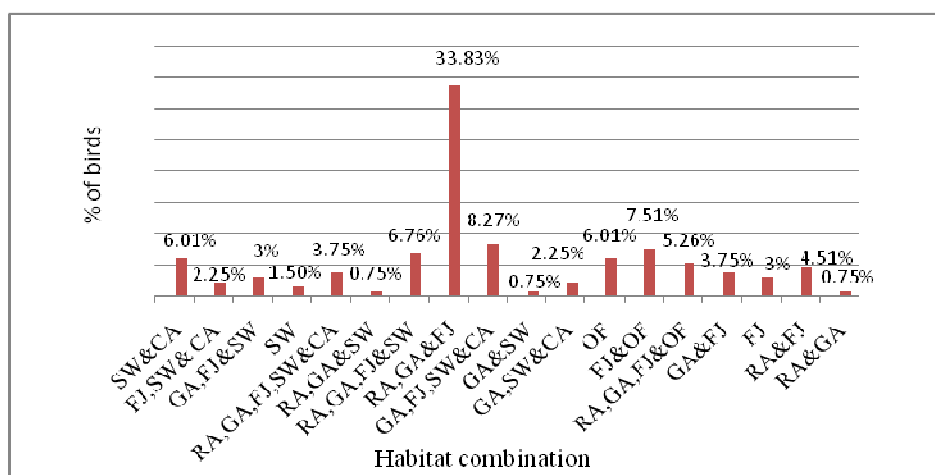
<i>Hirundo smithii</i>	Common Swallow	Chatak or Teltupi	+++	LM	IN	3,6	c
<b>Pycnonotidae :</b>	Wire-tailed Swallow	Dighaljeji	+++	LM	IN	3,6	c
<i>Pycnonotus cafer</i>							
<i>Pycnonotus jocosus</i>							
<b>Cisticolidae:</b>	Red-vented Bulbul	Fechuluka	+++	R	OM	1,2,3	c
<i>Megalurus palustris</i>	Red-whiskered Bulbul	Bulbuli	+++	R	OM	1,2,3	c
<b>Silvidae:</b>							
<i>Turdoides striatus</i>	Striated Marsh-Warbler	Nalchitiki	++	R	IN	2,3	c
<i>Pellorneum ruficeps</i>							
<b>Nectarinidae:</b>	Jungle Babbler	Satbhani	+	R	OM	1,2,3	c
<i>Dicaeum cruentatum</i>	Spotted Babbler	Phutuki Babbler	+	R	OM	1,2,3	c
<i>Dicaeum concolor</i>							
<i>Nectarinia zeylonica</i>	Scarlet-backed Flower-Peaker	Phulchuki	++	R	OM	1,2,3	c
<i>Aethopyga siparaja</i>	Plain Flower-Peaker	Phulchuki	++	R	OM	1,2,3	c
<i>Arachnothera longirostra</i>	Purple-rumped Sunbird	Moupia	++	R	OM	1,2,3	c
<b>Passeridae:</b>	Crimson Sunbird	Moupia	++	R	OM	1,2,3	c
<i>Anthus hodgsoni</i>	Little Spider-hunter	Moupia	++	R	OM	1,2,3	r
<i>Dendronanthus indicus</i>							
<i>Motacilla flava</i>	Olive-backed Pipit	Kechu Khati	++	WM	OM	1,2,3	c
<i>Motacilla cinerea</i>	Forest Wagtail	Balimahi	++	WM	CU	1,2,3,4	c
<i>Motacilla alba</i>	Yellow Wagtail	Balimahi	++	WM	CU	1,2,3,4	c
<i>Passer domesticus</i>	Grey Wagtail	Balimahi	++	WM	CU	1,2,3,4	c
<i>Ploceus benghalensis</i>	White Wagtail	Balimahi	++	WM	CU	1,2,3,4	c
<i>Ploceus manyar</i>	House Sparrow	Ghanchirika	+++	R	OM	1,2	c
<i>Lonchura punctulata</i>	Black-breasted Weaver	Tukura	++	R	OM	1,3	c
<i>Lonchura malacca</i>	Streaked Weaver	Tukura	++	R	OM	1,3	c
<i>Amandava amandava</i>	Spotted Munia	Phutuki Tuni	++	R	GR	1,2,3	c
	Black-headed Munia	Kola Tuni	+++	R	GR	1,2,3	c
	Red Munia	Ronga Tuni	++	R	GR	1,2,3	r

'+'-Rare; '++'-Normal; '+++'-Abundant; R-Resident; LM-Local Movement; WM-Migratory; IN-Insectivorous; CU-Carnivorous; HB-Herbivorous; GR-Granivorous; FR-Frugivorous; OM-Omnivorous; FE-Fish-eating; CA-Carion; 1-Residential area (RA); 2-Grassland area (GA); 3-Fragmented jungle (FJ); 4-Shallow-water Zone; (SW) 5-Core area (CA); 6-Overhead flight (OF); c-Common; r- Rare; Cr. EN- Critically endangered; VU-Vulnerable; NT- Near threatened.





**Figure 1: Percentage of feeding habit of birds in the IBA-site.**



**Figure 2: Percentage of birds in different habitat combinations in the IBA-site**

RA=residential area; FJ=fragmented jungle; GA=grassland area;  
SW=shallow water; CA=core area and OP=overhead flight.

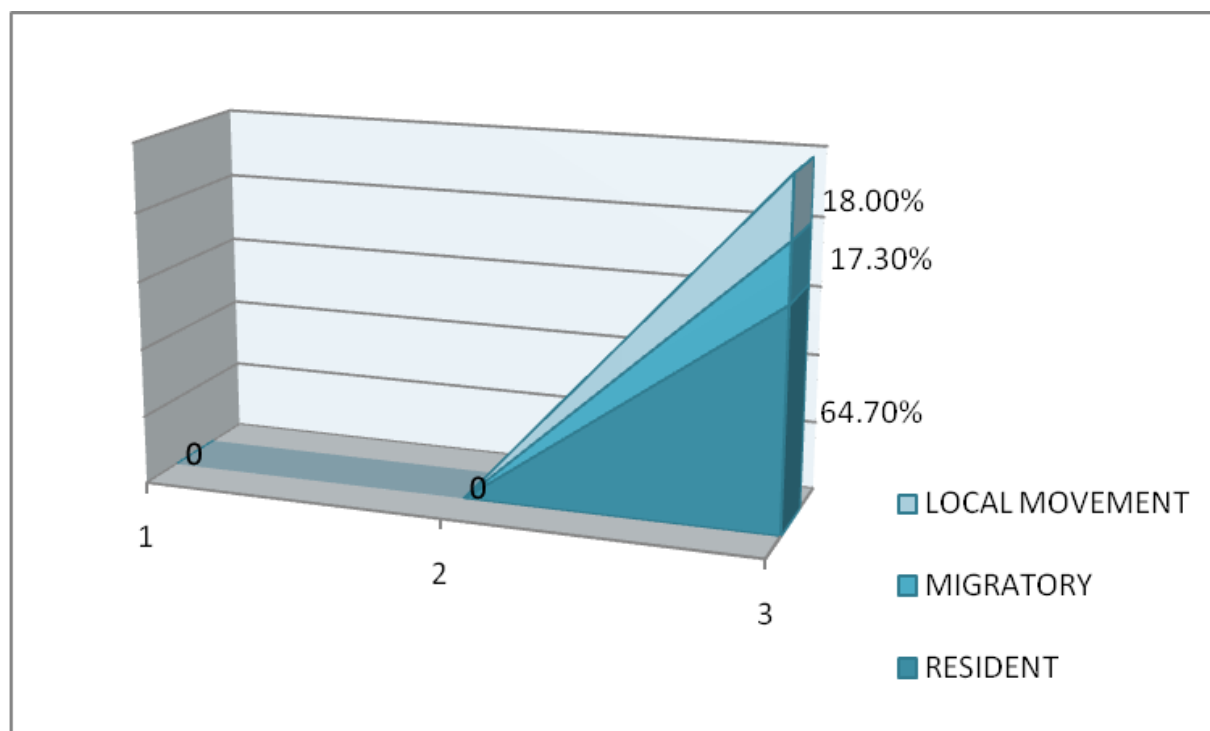


Figure 3: Percentage of different category of birds in the IBA-site.

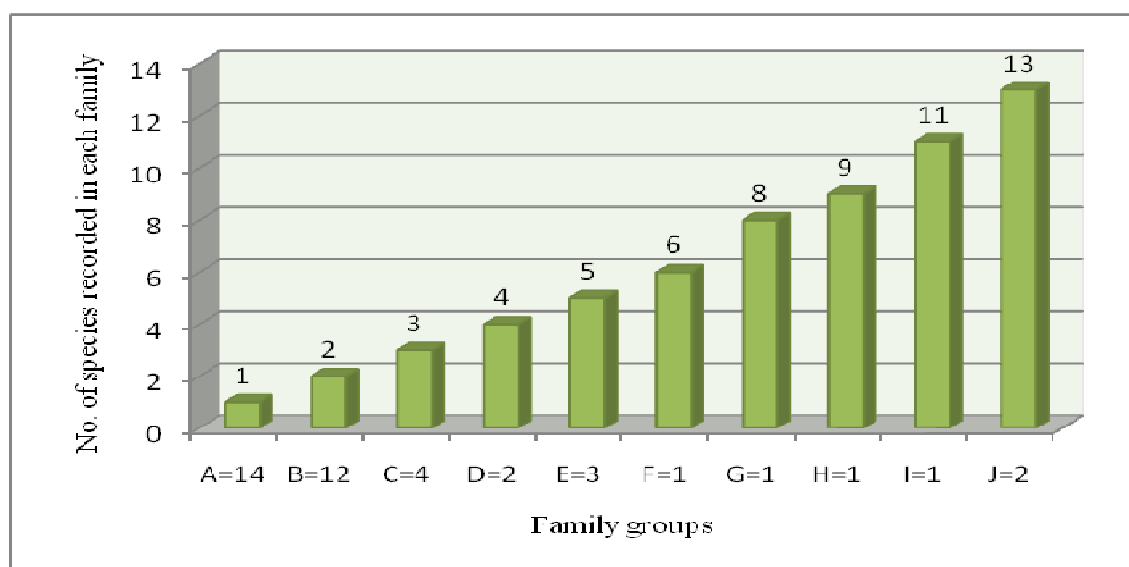


Figure 4: No. of species and group of bird families recorded in the IBA-site.

A=14 (*Upupidae*, *Coraciidae*, *Alcedinidae*, *Cerylidae*, *Apodidae*, *Tytonidae*, *Strigidae*, *Caprimulgidae*, *Charadiidae*, *Anhingidae*, *Threskiornithidae*, *Pelecanidae*, *Paridae*, *Cisticolidae*) B=12 (*Phasianidae*, *Megalaimidae*, *Dacelonidae*, *Meropidae*, *Scolopacidae*, *Jacacidae*, *Laridae*, *Podicipedidae*, *Laniidae*, *Hirundinidae*, *Pycnonotidae*, *Silvidae*), C=4 (*Picidae*, *Cuculidae*, *Psittacidae*, *Phalacrocoracidae*); D=2 (*Rallidae*, *Sturnidae*); E=3 (*Ciconnidae*, *Muscicapidae*, *Nectarinidae*), F=1 (*Columbidae*); G=1 (*Corvidae*); H=1 (*Ardeidae*); I=1 (*Passeridae*); J=2 (*Anatidae*, *Accipitridae*).

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