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Environmental assessment of avi-faunal study of Gokharkuda: A coastal village eco-complex of Ganjam district, Odisha

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Abstract
The coastal faunal diversity maintained natural process, upholding the environmental assessment throughout the world by playing a vital role in sustaining of coastal ecosystem. A total 123 number of bird species recorded from in and around the Gokharkuda, a coastal village of coastal Ganjam district of Odisha. During field study it was found that out of total 123 species, family Scolopacidae belongs to 13 no of species and most are mostly dominant family fallowed by Ardeidae (10). The animal kingdom of the coastal village Gokharkuda is efficiently and ecologically very important. Survivability of the coastal village eco-complex is flourished with these small numbers of faunal richness by pollination. Appropriate planned management needs for coastal village ecosystem conservation for futures' balance with human life. The recent assessment gives an idea of particular Avi-fauna at coastal marine village eco-complex of Ganjam district in Odisha.

Keywords: Avi-fauna diversity, Gokharkuda, coastal village eco-complex

Introduction

Coastal fauna are limited and are generally neglected group, especially in the Indian context, but contain unique faunal elements. The harsh coastal conditions have lead to a poor faunal and floral diversity, but most of the existing organisms are highly adapted and specialised to overcome drastic cruel environmental situation. (Mahapatra *et al*., 2013 & Mallik *et al*., 2015) [2].

Bird watching are very common, everyone curiously observe and enjoy its different colorful beautiful feathers, free flying capability on the top of sky, the cheeriness of their unique incredible mesmerizing musical tuned songs to attract nature. They are pre bio indicator for environmental assessment of our biodiversity. Rapid decrease of bird population specifies the sensitiveness of disastrous environmental pollution. As per Sekercioglu *et al*., (2012) [3] coastal bird species are the most vulnerable and approximately 100-150 birds extinct due to global climate change. Coastal Birds are very important role played in several tropic levels of food web ecosystem, served as potential pollinators, scavenging carcasses, destroyers of insect and pests, cycling of nutrient, seed dispersal in the coastal environment of Ganjam.

Avifauna shows maximum diversity among Indian subcontinent is well-known for its rich and diverse bird species whose taxonomy, distribution and habitat characteristics are well documented in India encompasses 1340 species out of 9,900 birds of the world which contribute more than 15% of the world's bird species (Samita, 2020) [4]. Environmental assessment of bird community has become an important tool in biodiversity management for identifying conservative actions with high human pressure. Most of the birds are aesthetically significant to mankind and Bird-watching has become one of the most popular recreational activities around the world and has direct economic benefits as well as indirect benefits through numerous citizen science programs involving bird-watchers.

Due to both natural and anthropogenic disturbances such as floods, drought, deforestation, change in land use, natural resources and seasonal climatic changes, global diversity of birds is decreasing continually (Grimmet *et al*., 2013) [5]. Habitat destruction along with electro-magnetic radiation of telephone towers are an alarming factor for decreasing the bird fertility. Most of the birds require specific habitats from season to season for nesting; foraging, roosting and loss of such habitats may lead to their extinction (Kumar *et al*., 2005) [6]. For easy commercial growth cutting of old traditional nesting trees is also responsible for avian habitats limitation. Therefore, many species of birds may be forced to reside in the urban areas for breeding and feeding purpose.

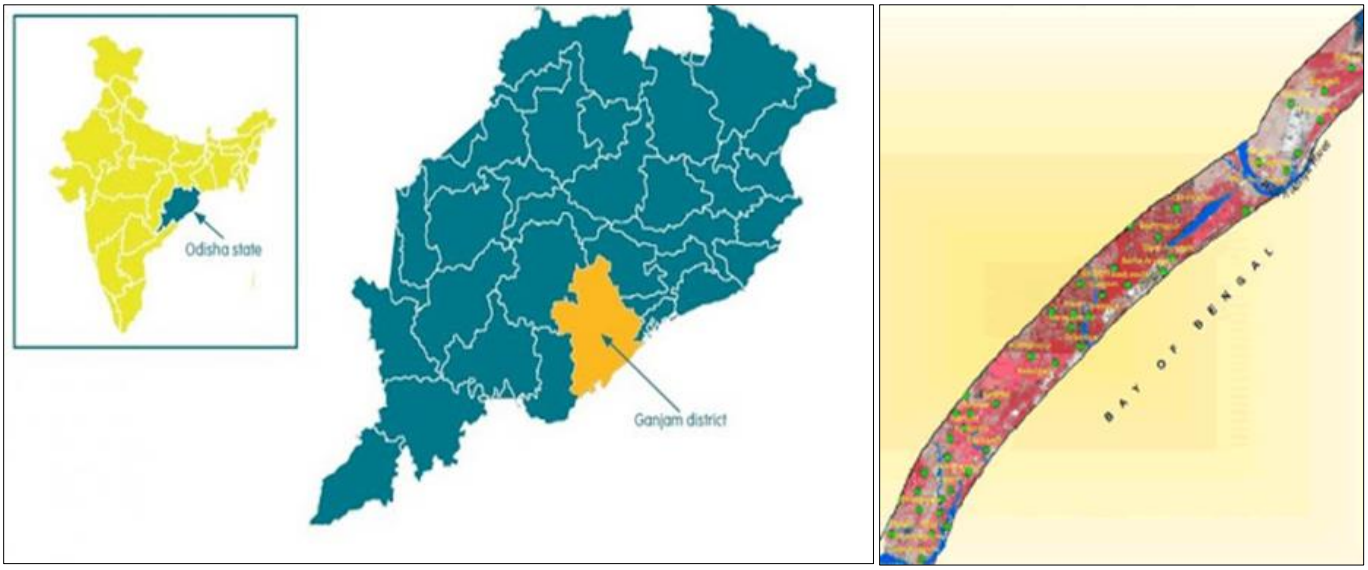

Fig 1: Show the Study area of coastal village Gokharkuda studied during 2014 to 2016.

The coastal Ganjam district located in between 18^0. 58' N and 84^0 11' E the coastal marine fishing village named Gokharkuda; major focused site comes under Palibandha G.P. (Gram Panchayat) of Ganjam block and Tahasil of Ganjam district is a single revenue village faced towards the Bay of Bengal and at the end point of neighbor village Purunabandha Rushikulya river mouth cross. The space in between village and the seashore area are restricted for Olive Ridley sea turtle congregation for seven months each year for their favorable mass nesting condition. Almost each season are moving the area throughout the year. Rainy season's starts in-between mid-June to October end, winter season start from November to February end and summer falls from March to June mid. Rainwater droplets found approximately 15.2 mm to 16.4 mm with average temperature of 37 ^{0}C to 19 ^{0}C varied.

Methodology

During the 2013 to 2016 the Avi-fauna survey of this particular coastal village was occurred. Aassessments was conducted at the study area's adjacent open forest areas, grasslands, scrublands, agricultural habitats and residential places; at water bodies and she shore lines in the study area. Bird lovers cum bird watchers help taken in this regard. Huge information gathered from local village fisher-folk communities along with field official staffs of forest department to identify birds species presence in the confined region, are familiar these place. Standard literatures were used for birds' identification. Faunal species from the adjacent village area were recorded based on direct sightings. During the early morning hours and at night, are searched at the edges of water bodies and streams primarily in the sunset hours. During interaction with local people who frequent visit the forest to collect their food, fodder and fuel. Pictorial representations of particular species were used in the form of field guides. The species occurring within the study area are discussed in the following sections:

The aim of the present study was enlightened distributional pattern of birds in the adjacent and peripheral area of this particular coastal village eco-complex of Ganjam coast.

Results

According to movement and seasonality occurrence, sight frequency bird investigation was done in between village periphery and coastal dry deciduous forest along with Sea Shore. The finding Avifauna are categorized according to their family. The detailed species which are identified at coastal village eco-complex adjacent place of Gokharkuda village tabulated with zoological scientific name and common name in the table no. 1 at given below according to handbook of Ali (2002) [7].

Table 1: Avi-faunal Status of Coastal village eco-complex of Gokharkuda village of Ganjam, Odisha

Sl. No	Name	Scientific Name	Family
1	Shikra	*Accipiter badius*	Accipitridae
2	Bank Myna	*Acridotheres ginginianus*	Sturnidae
3	Common Myna	*Acridotheres tristis*	Sturnidae
4	Common Sandpiper	*Actitis hypoleucos*	Scolopacidae
5	Common Kingfisher	*Alcedo atthis*	Alcedinidae
6	White breasted Waterhen	*Amaurornis phoenicurus*	Rallidae
7	Common Teal	*Anas crecca*	Anatidae
8	Eurasian Wigeon	*Anas penelope*	Anatidae
9	Spot billed Duck	*Anas poecilorhyncha*	Anatidae
10	Asian Openbill	*Anastomus oscitans*	Ciconiidae
11	Darter	*Anhinga melanogaster*	Anhingidae
12	Little Swift	*Apus affinis*	Apodidae

13	Grey Heron	*Ardea cinerea*	Ardeidae
14	Goliath Heron	*Ardea goliath*	Ardeidae
15	Intermediate Egret	*Ardea intermedia*	Ardeidae
16	Purple Heron	*Ardea purpurea*	Ardeidae
17	Indian Pond Heron	*Ardeola grayii*	Ardeidae
18	Jungle babbler	*Argya striata*	Leiothrichidae
19	Spotted Owlet	*Athene brama*	Strigidae
20	Cattle Egret	*Bubulcus ibis*	Ardeidae
21	Curlew Sandpiper	*Calidris ferruginea*	Scolopacidae
22	Little Stint	*Calidris minuta*	Scolopacidae
23	Long-toed Stint	*Calidris subminuta*	Scolopacidae
24	Great Egret	*Casmerodius albus*	Ardeidae
25	Red-rumped Swallow	*Cecropis daurica*	Hirundinidae
26	Greater Coucal	*Centropus sinensis*	Cuculidae
27	Pied Kingfisher	*Ceryle rudis*	Cerylidae
28	Red wattled Lapwing	*CharadriidaeVenellus*	Charadriidae
29	Little Ringed Plover	*Charadrius dubius*	Charadriidae
30	Jerdon's Leaf bird	*Chloropsis jerdoni*	Chloropseidae
31	Brown headed Gull	*Chroicocephalus brunnicephalus*	Laridae
32	Purple Sunbird	*Cinnyris asiaticus*	Nectariniidae
33	Western Marsh Harrier	*Circus aeruginosus*	Accipitridae
34	Rock/common Pigeon	*Columba livia*	Columbidae
35	Indian Robin	*Copsychus fulicatus*	Muscicapidae
36	Oriental Magpie Robin	*Copsychus saularis*	Muscicapidae
37	Indian Roller	*Coracias benghalensis*	Coraciidae
38	Indian Jungle Crow	*Corvus culminatus*	Corvidae
39	Large Billed Crow	*Corvus macrorhynchos*	Corvidae
40	House Crow	*Corvus splendens*	Corvidae
41	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae
42	Rufous Treepie	*Dendrocitta vagabunda*	Corvidae
43	Fulvous-breasted Woodpecker	*Dendrocopos macei*	Picidae
44	Lesser Whistling Duck	*Dendrocygna javanica*	Anatidae
45	Pale-billed Flowerpecker	*Dicaeum erythrorhynchos*	Dicaeidae
46	White bellied Drongo	*Dicrurus caerulescens*	Dicruridae
47	Black Drongo	*Dicrurus macrocercus*	Dicruridae
48	Little Egret	*Egretta garzetta*	Ardeidae
49	Black shouldered Kite	*Elanus caeruleus*	Accipitridae
50	Ashy-crowned Sparrow Lark	*Eremopterix griseus*	Alaudidae
51	Asian Koel	*Eudynamys scolopacea*	Cuculidae
52	Indian Silverbill	*Euodice malabarica*	Estrildidae
53	Common Eurasian Coot	*Fulica atra*	Rallidae
54	Water cock	*Gallicrex cinerea*	Rallidae
55	Common Snipe	*Gallinago gallinago*	Scolopacidae
56	Pintail Snipe	*Gallinago stenura*	Scolopacidae
57	Common Moorhen	*Gallinula chloropus*	Rallidae
58	Red Spurfowl	*Galloperdix spadicea*	Phasisnidae
59	Asian pied Starling	*Gracupica contra*	Sturnidae
60	Black Capped Kingfisher	*Halcyon pileata*	Alcedinidae
61	White throated Kingfisher	*Halcyon smyrnensis*	Halcyonidae
62	White bellied Sea Eagle	*Haliaeetus leucogaster*	Accipitridae
63	Brahminy Kite	*Haliastur indus*	Accipitridae
64	Black winged stilt	*Himantopus himantopus*	Recurvirostridae
65	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Jacanidae
66	Cinnamon Bittern	*Ixobrychus cinnamomeus*	Ardeidae
67	Long-tailed Shrike	*Lanius scach*	Laniidae
68	Black headed Gull	*Larus ridibundus*	Laridae
69	Jack Snipe	*Lymnocryptes minimus*	Scolopacidae
70	Coppersmith Barbet	*Megalaima haemacephalus*	Ramphastidae
71	Brown headed Barbet	*Megalaima zeylanica*	Megalaimidae
72	Green Bee-Eater	*Merops orientalis*	Meropidae
73	Little Green Bee-eater	*Meropus orientalis*	Meropidae
74	Intermediate Egret / Median Egret	*Mesophoyx intermedia*	Ardeidae
75	Bronze winged Jacana	*Metopidius indicus*	Jacanidae
76	Little Indian cormorant	*Microcarbo niger*	Phalacrocoracidae

77	Black Kite	*Milvus migrans*	Accipitridae
78	Grey Wagtail	*Motacilla cinerea*	Motacillidae
79	White-browed wagtail	*Motacilla maderaspatensi*	Motacillidae
80	Painted Stork	*Mycteria leucocephala*	Ciconiidae
81	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae
82	Cotton Pygmy Goose	*Nettapus coromandelianus*	Anatidae
83	Eurasian Curlew	*Numenius arquata*	Scolopacidae
84	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae
85	Black-Hooded Oriole	*Oriolas xanthornus*	Oriolidae
86	Common Tailorbird	*Orthotomus sutorius*	Cisticolidae
87	House sparrow	*Passer domesticus*	Passeridae
88	Common Peafowl	*Pavo cristatus*	Phasianidae
89	Chestnut-shouldered Petronia	*Petronia xanthocollis*	Passeridae
90	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae
91	Glossy Ibis	*Plegadis falcinellus*	Threskiornithidae
92	Baya Weaver	*Ploceus phillipinus*	Ploceidae
93	Grey headed Swamphen	*Porphyrio poliocephalus*	Rallidae
94	Purple Swamphen	*Porphyrio porphyrio*	Rallidae
95	Plain Prinia	*Prinia inornata*	Cisticolidae
96	Black Ibis / Red-naped Ibis	*Pseudibis papillosa*	Threskiornithidae
97	Coppersmith Barbet	*Psilopogon haemacephalus*	Megalaimidae
98	Plum headed Parakeet	*Psittacula cyanocephala*	Psittacidae
99	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae
100	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae
101	Pied Bushchat	*Saxicola caprata*	Muscicapidae
102	Indian Robin	*Saxicoloides fulicatus*	Muscicapidae
103	Spotted Dove	*Spilopelia chinensis*	Columbidae
104	Laughing Dove	*Spilopelia senegalensis*	Columbidae
105	Crested Serpent Eagle	*Spilornis cheela*	Accipitridae
106	River Tern	*Sterna aurantia*	Sternidae
107	Common Tern	*Sterna hirundo*	Laridae
108	Spotted Dove	*Streptopelia chinensis*	Columbidae
109	Eurasian Collared Dove	*Streptopelia decaocto*	Columbidae
110	Chestnut-tailed Starling	*Sturnia malabarica*	Sturnidae
111	Brahminy Starling	*Sturnia pagodarum*	Sturnidae
112	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae
113	Ruddy Shelduck	*Tadorna ferruginea*	Anatidae
114	Black headed Ibis	*Threskiornis melanocephalus*	Threskiom
115	Yellow-footed Pigeon	*Treron phoenicopterus*	Columbidae
116	Spotted Redshank	*Tringa erythropus*	Scolopacidae
117	Common Greenshank	*Tringa nebularia*	Scolopacidae
118	Green Sandpiper	*Tringa ochropus*	Scolopacidae
119	Marsh Sandpiper	*Tringa stagnatilis*	Scolopacidae
120	Common Redshank	*Tringa totanus*	Scolopacidae
121	Common Hoopoe	*Upupa epops*	Upupidae
122	Red wattled Lapwing	*Vanellus indicus*	Charadriidae
123	Yellow wattled lapwing	*Venellus malabaricus*	Charadriidae

A total of 123 bird species were recorded from the study area. The details of species are mentioned in table - 1.

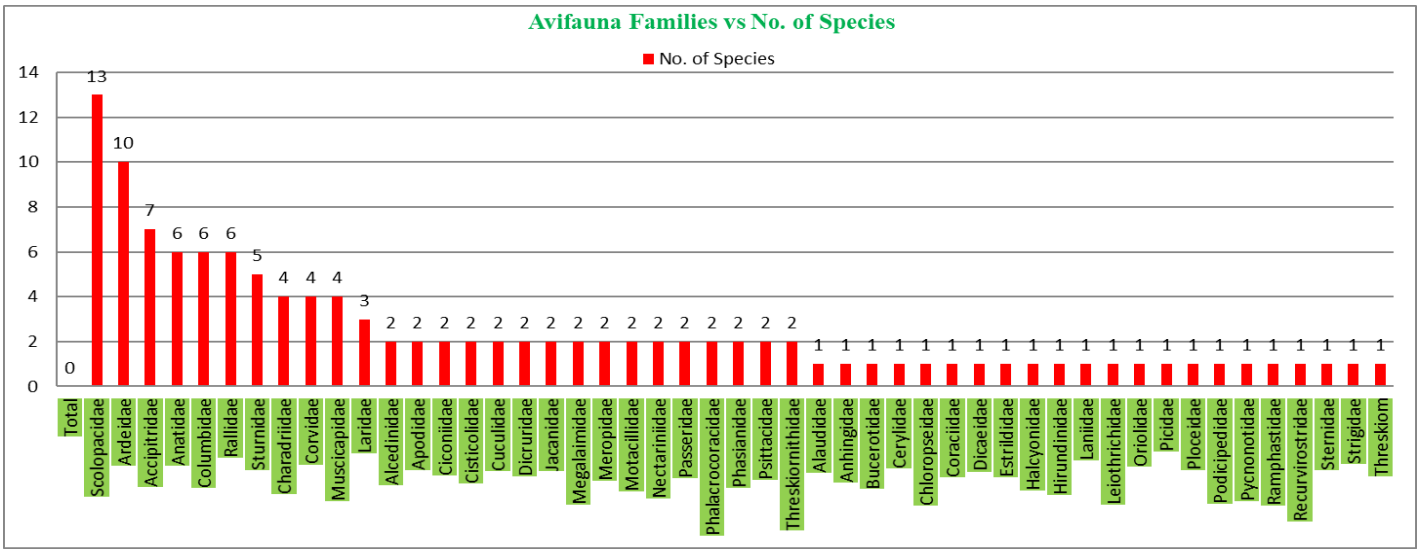

Fig 2: Shown the number of species belongs to avifauna families.

A total 123 species of coastal birds with 50 families were recorded. Of all the families Scolopacidae having 13 species, Ardeidae (10), Accipitridae (7), Anatidae, Columbidae and Rallidae (6 species each), Sturnidae (5) and Charadriidae, Corvidae and Muscicapidae (4 species each), Laridae (3), Apodidae, Ciconiidae, Cisticolidae,Cuculidae, Dicruridae, Jacanidae, Megalaimidae, Meropidae, Motacillidae, Nectariniidae, Passeridae, Phalacrocoracidae, Phasianidae, Psittacidae and Threskiornithidae (2 species each) Alcedinidae, Alaudidae, Anhingidae, Bucerotidae, Cerylidae, Chloropseidae, Coraciidae, Dicaeidae, Estrildidae, Halcyonidae, Hirundinidae, Laniidae, Leiothrichidae, Oriolidae, Picidae, Ploceidae, Podicipedidae, Pycnonotidae, Ramphastidae, Recurvirostridae, Sternidae, Strigidae, Threskiom and Upupidae (1 species each). It is expected that this study would provide a preliminary database for the coastal birds of this area force the further research.

As picture taken little bit difficult. Brahminy Kite (*Haliastur indus*), Shikra (*Accipiter badius*), Black Kite (*Milvus migrans*) were listed as Schedule I as per Wildlife Protection Act, 1972. Black-headed Ibis (*Threskiornis melanocephalus*), Eurasian Curlew (*Numenius arquata*) and River tern (*Sterna aurantia*) are listed as near threatened as per IUCN Classification (IUCN version 2016-2).

Conclusion

The village area constantly losing their dry deciduous forests and salty climatic agricultural forestry due to over utilization of resources by anthropogenic pollution, loss of natural habitat demolition, more alteration with environmental degradation by continual loss with human hindrance gave a negative impact on survivability of both migratory and seasonal bird's habitat. The scarcities of hiding habitat place, spotting availability of small carnivorous animals and scavengers are distracted the bird attitude.

The localities of peripheral biodiversity control the coastal village ecosystem with livelihood generation requirements partially or fully with the basic needs like food and shelter for animal kingdom which depends on the particular village eco-complex. The people of this coastal ecosystem are completely depending on the fishing activities at the Bay of Bengal sea shore. Commercial Anthropogenic judicious utilization of this coastal area for economic development vanish a lot of vegetation on which the fauna survive and nourish themselves is very important for threatened ecosystem. The coastal fauna with vegetation should be protected, for ecological food chain maintenance which is also washed by high tidal rough sea water and also seasonal coastal cyclonic storms. The coastal village eco-complex area's communities are familiar with all mentioned animals' behavioral activities. A continual management of biodiversity conservation should need to maintain for threatened faunal ecology which also support the local fisher folk of coastal village eco-complex of Odisha.

Olive ridley turtles' native nesting occurred along the sea shore line of Gokharkuda and Chilika Lake, world's largest brackish water lagoon is its adjacent place. As a result, various migrated birds are visit frequently for new safe shed, shelter with nature lovers, wildlife researchers, bird watchers on this study place which developed as a mini eco-tourism hotspot for nine months; will also help to take initiation for conserve bird populations in coastal district of Ganjam. For increasing a variety of birds get-together in one place; need continual planned environmental assessment for conservation of avifauna habitat with growing of coastal village eco-complex of particular marine ecosystem including sustainable livelihood opportunities generating, bird habitat related forest area rising need at coastal Odisha. A specific village based eco-tourism hub creates by the support of confined fisher folk community's straight involvement.

Acknowledgement

The survey was conducted by the research author with standard methodologies and taking support of local village community, bird lovers and watchers, wildlife activist and also forest departmental staff. A long-term depth study need for all

migratory, seasonal and wild fauna identification with habitat behavior through literature and field research.

Conflict of Interest Statement:
We the research authors have declared that, there is no conflict of interest.

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