



## Anthropogenic impact on avifauna near protected forest areas: A case study of Jalpaiguri and Alipurduar districts, West Bengal

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### Abstract

Travel and tourism continues to be one of the worlds' largest industries. Tourism accounts for a minor share of global water use in comparison to agriculture, which constitutes an estimated 70 percent of total water consumption. Water shortage is directly influencing the tourist market as it is a large consumer of water. But water protects ecosystem and biodiversity by providing minimum stream flow necessary for wildlife, wetlands necessary for migratory birds and landscape necessary for protecting wild habitat. The main objective of the study is to discuss about the protection of natural habitat of flora and fauna and promote eco-tourism and to raise some issues regarding preservation of natural resources. Northern part of West Bengal is a perfect example of ecological and cultural hot spot which provide shelter to numerous avifauna; has been selected for the study. Both primary and secondary data have been collected from various sources for generating data base of tourist inflow and conversion of natural habitats of various a avifauna. The finding of the study reveals that effective regulatory frameworks for tourism and water management should be formed to protect the avifauna natural resources.

**Keywords:** avifauna, biodiversity, eco-tourism, natural habitat, resource management

### 1. Introduction

The *Tarai - Duars* region mainly comprising the districts of Jalpaiguri and Alipurduar of West Bengal which is physiographically categorised as the foot hills of Himalaya. It stretches from River *Teesta* on the west to the River *Sankosh* on the east and covers a major part of these two districts. A vast texture of dense forests teeming with wildlife, undulating tea gardens, bubbling rivers, interspersed with sleepy or busy settlements. At the confluence of the Indian- Chinese and Indian bio-geographical realms, this region is unique in providing abundance of habitats, which features diverse biota with high level of endemism. Birds are seen everywhere but especially found with many species in natural reserves. From vultures to sparrows, bird populations are in declining state, with destruction of their traditional habitat caused by anthropogenic activities and pollution of wetlands putting pressure on their survival. Illegal trapping and hunting further added to the problem. Wildlife tourism as a part of eco-tourism is highly responsible and educative kind of nature based tourism which helps conserve natural environment and cultural values of the local area, develop community and bring about remarkable economic benefits. In West Bengal there are five bird sanctuaries covering 408 sq. km area have great potentials to develop bird watching ecotourism. In order to develop this type of tourism model in natural reserve, it is necessary to improve personnel's capability and to set up database for identifying wild birds in each area. Conserving precious and specific bird species, characteristic communities for habitats plays an important role in attracting tourists in West Bengal for bird watching. Being located in the Eastern

Himalayas Endemic Bird Area (EBA 130), having a great variety of typical sceneries and ecological systems, with a rich cultural ethnic identities West Bengal has a great potential for the development of tourism in general and ecotourism in particular. A large number of natural resources for tourism, such as the National Parks, Sanctuaries, Nature Reserves, aquatic or marine conservation areas have been put to use for development of tourism, in which bird watching travel is included.

### 2. Objectives

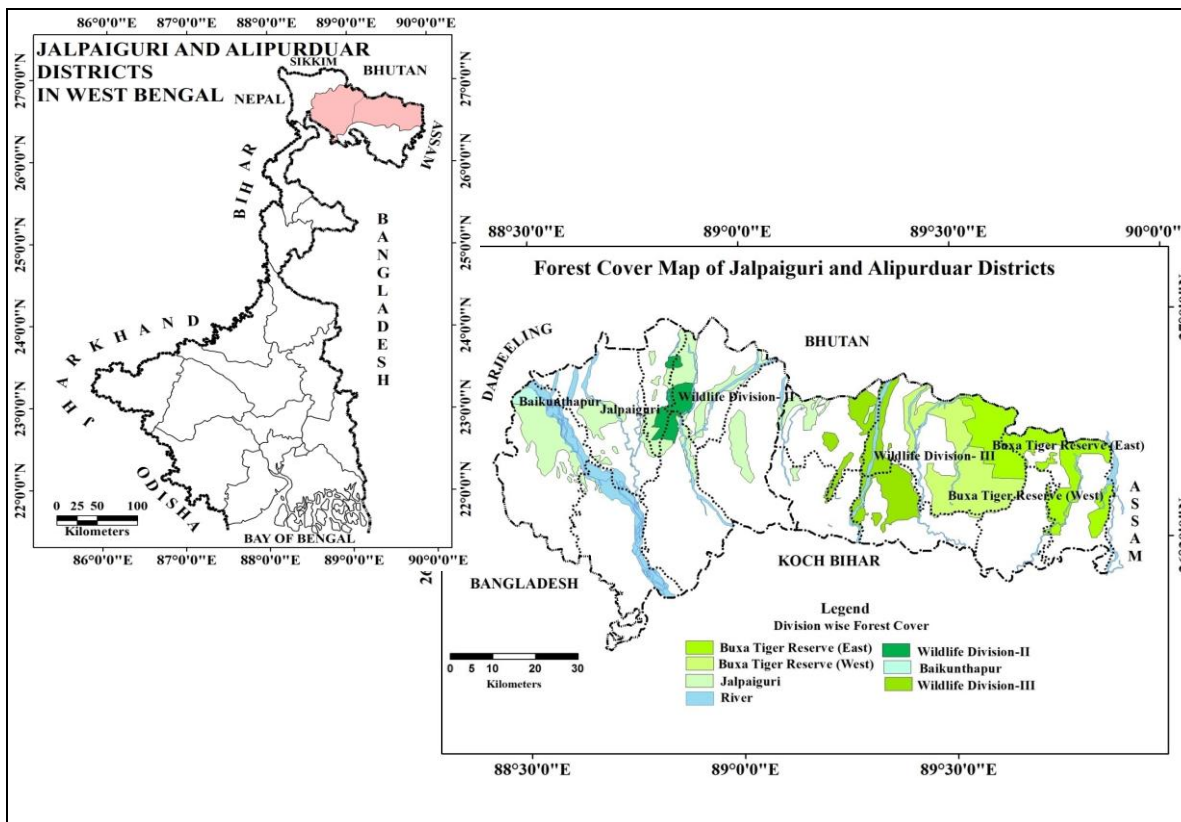
The present paper embraces the following objectives:

- To discuss about the protection of natural habitat of flora and fauna specially the avifaunal diversity
- To examine the promotion of well organised wildlife tourism as a part of eco-tourism; and
- To raise some issues regarding preservation of natural resources.

### 3. Materials and Methods

The present study is mostly based on Secondary data. Primary data has been generated through field survey and direct contact with tourists and common people of this region. The main sources of Secondary data used in this study are: Divisional Forest Office, Wildlife Division II, Jalpaiguri (2014),<sup>[3]</sup> Resort Owners Association Lataguri (2014) and other relevant texts. Primary data was collected with the help of structured questionnaire. The questionnaire was administered to 85 respondents at Lataguri and Buxa. The respondents were the tourists; transport workers.

#### 4. Study Area



Source: DPMS of Jalpaiguri District and NATMO, 2011

Fig 1: Location of the Study Area

Gorumara National Park (GNP) situated in Jalpaiguri District, Buxa Tiger Reserve (BTR) and Jaldapara Wildlife Sanctuary (JWLS) of newly created Alipurduar district have been selected for the study. Islam and Rahmani (2004) [4] stated that Garumara National Park is falls under Indo-Malaya Eco region within Gangetic Plain Bio-geographic Zone on the other hand Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary is comes under the transition Zone between Biome–8 (Sino-Himalayan Subtropical Forest) and Biome–12 (Indo-Gangetic Plain). The region is ideal for Nature Tourism particularly for bird watchers. Water bodies and forest attracts

a number of water birds from Ladakh and Central Asia (Inglis *et al.*, 1918-20) [3]. This place is also frequent by the beauty Brahmini Duck, many species of storks, cormorants. In one word it can be stated that this entire region is a “Paradise of Ornithologists” (Sattersfield *et al.*, 1998) [7].

#### 5. Findings / Results

In Gorumara, some birds are recorded vulnerable i.e. Swamp Francolin, Lesser Adjutant, Pallas's Fish-eagle, Greater Spotted Eagle, Eastern Imperial Eagle, Snowy-throated Babbler, Black-breasted Parrotbill due to contract of water bodies.

Table 1: List of Vulnerable, Critically Endangered and Endangered Avifauna of the study area

IUCN Category	Gorumara National Park (GNP)	Buxa Tiger Reserve (BTR)	Jaldapara Wildlife Sanctuary (JWLS)
Vulnerable	Swamp Francolin, Lesser Adjutant, Pallas's Fish-eagle, Greater Spotted Eagle, Eastern Imperial Eagle, Snowy-throated Babbler, Black-breasted Parrotbill	Swamp Francolin, Chestnut-breasted Partridge, Lesser Adjutant, Black-necked Crane, Wood Snipe, Indian Skimmer, Rufous-necked Hornbill, Grey-crowned Prinia, Bristled Grassbird, Jerdon's Babbler, Black-breasted Parrotbill, Beautiful Nuthatch	Lesser Adjutant, Pallas's Fish-eagle, Black-breasted Parrotbill, Yellow Weaver
Critically Endangered	White-rumped Vulture, Bengal Florican	White-rumped Vulture, Slender-billed Vulture,	Bengal Florican
Endangered	.....	Manipur Bush-quail	.....

Source: <http://www.birdlife.org/datazone/sitefactsheet.php?id=18455>, modified by the author

White-rumped Vulture, Slender-billed Vulture and Bengal Florican are in critical state of endemism in Buxa and Jaldapara (Ali *et al.*, 1983) [1] which shown in table 1. Above

all most common activity is illegal poaching and trapping of wild birds decrease the population and compel them to become extinct.

**Major findings**

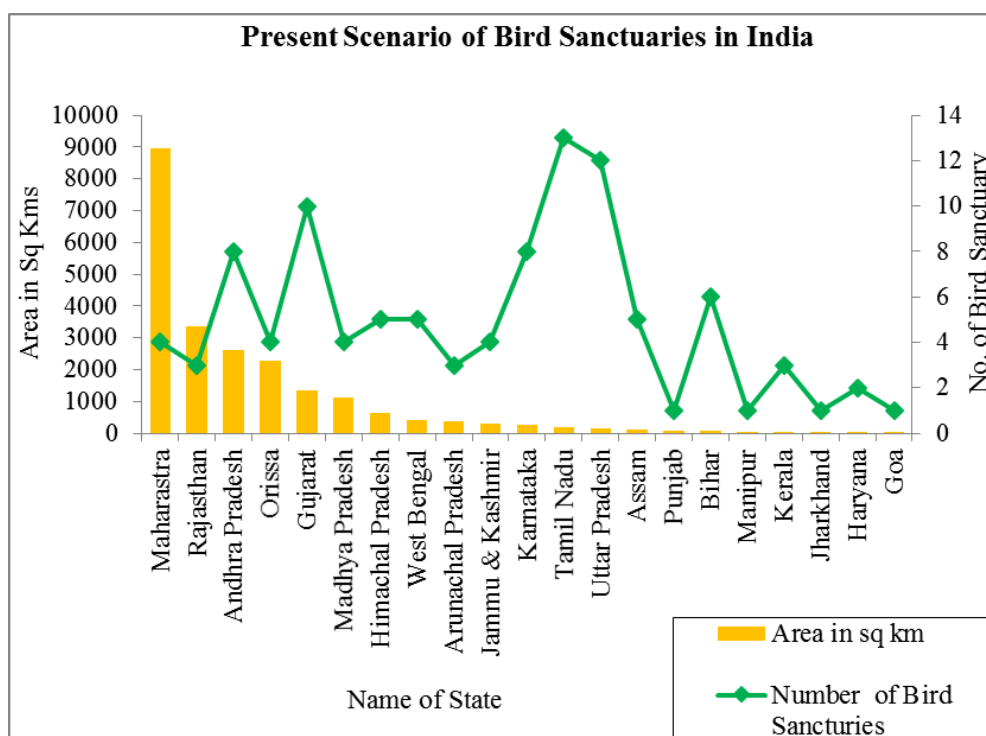
- Riparian wetlands adjacent to rivers and streams which are usually linear in shape and occur as narrow strips of stream bank vegetation of are the nesting place of avifauna are not protected
- Marshes and swamps associated with flowing water present near the forest have high productivity are being converted into human habitation
- Increasing anthropogenic activities hamper the natural shelters of various birds in the study area
- Tourists are not conscious about the temperament of forest ecology.

**6. Discussion**

West Bengal offers the tourists an opportunity to experience tranquillity and serenity. Regarding the potentiality of tourism development Islam and Rahmani (2004)<sup>[4]</sup> highlighted that the northern part of West Bengal encompasses a number of Sanctuaries, National Parks, Reserve Forests and Wetlands which supports enormous biodiversity. Champion and Seth (1968)<sup>[2]</sup> have classified northern part of Bengal as Moist tropical forest, Tropical dry deciduous and Tropical semi evergreen forest region photographically. Gorumara, Buxa Tiger Reserve and Jaldapara Wildlife Sanctuary are most important areas carrying the legacy of rich biodiversity. In Gorumara National Park, there are almost 326 species of plants including 158 species of trees and 32 species of grasses. Maheswaran (2002) stated that, in Gorumara there are 48

species of mammals, 193 species of birds, 22 species of reptiles, 7 species of turtles, 27 species of fishes and other macro and micro fauna is recorded. The park also shelters One-horned Rhinoceros (*Rhinoceros unicornis*).

In Buxa Tiger Reserve, 73 species of mammals, 76 species of reptiles and 5 species of amphibians are found. Some government documents assert the presence of 390 species of birds in this reserve which harbour large numbers of local and migratory birds. It comes under the dominance of Moist Tropical Forest category as stated by Champion and Seth (1968)<sup>[2]</sup>. According to IBA Gorumara, Buxa and Jaldapara fall within the Eastern Himalayas Endemic Bird Area (EBA 130). IBA site code of IN317, IN319 and IN320 i.e. Buxa Tiger Reserve, Gorumara National Park and Jaldapara Wildlife Sanctuary reflects A1and A2 (sites that harbours significant numbers of a globally threatened species and restricted range species separated geographically in terms of breeding area distribution, or other species of global conservation concern as categorized by the International Union for Conservation of Nature and Natural Resources (IUCN) Red List criteria. Being a part of Important Bird and Biodiversity Area (IBA), all these places are recognized as significant habitat and important place for conservation of bird population globally. From figure 2 it is clear that West Bengal having five bird sanctuaries including Gorumara, Buxa, and Jaldapara come into the picture of Indian scenario after Tamil Nadu, Uttar Pradesh and Gujarat.



Source: Statistics, Infrequent flyers, Times of India, 22<sup>nd</sup> September, 2015

Fig 2: Bird Sanctuaries present in India

Jaldapara is exceptionally rich in avifauna because of varied terrain, mosaic of vegetation and rich insect life. More than 240 species of birds are found in variety of habitat- Grassland,

water bodies, woodland. The varied tree forests and rich shrub growth on the forest floor provide ideal setting for many woodland birds, such as Green Pigeons, Hornbills, Barbets,

Parakeets, Woodpeckers, Cuckoos, Orioles, Drongos, Babblers, Thrushes etc. Brahmini ducks, whistling teals and Goosanders are winter visitors (Ali *et al.*, 1983) <sup>[1]</sup>. The most common water birds are the large and little cormorant, Indian Shag, Darter, Egrets, Lesser Adjutant Stork, Pied Wagtail, Spur Winged Lapwing, Moorhen, and White Breasted Water hen etc. The night hunters in Jaldapara are the owls and the nightjars. But accelerating anthropogenic activities especially commercial tourism has caused significant habitat alteration. The existence of these beautiful creatures is in danger. It is necessary to conserve them as to look after the common future of Man and Environment.

## 6.1 Promotion of eco-tourism to minimize the impact of commercial tourism on environment

### 6.1.1 Water resource management

Commercial tourism puts pressure on the natural resources. Water resources, especially fresh water, are one of the most critical natural resources decreasing and polluted by tourism industry by overuses water resources for hotels, swimming pools, golf courses and personal use of water by tourists. It results water shortages and degradation of water supplies, as well as generating a greater volume of waste water. Construction of hotels, recreation and other facilities often leads to increased sewage pollution. Wastewater pollutes rivers surrounding tourist attractions, damaging the flora and fauna.

### 6.1.2 Natural resource management

Tourism activity can create great pressure on local resources like energy, food and other raw materials. Construction of

tourism and recreational facilities has increased pressure on land resources and on scenic landscapes. Forests often suffer negative impacts of tourism in the form of deforestation caused by fuel wood collection and land clearing. In areas with high concentrations of tourist activities and appealing natural attractions, waste disposal is a serious problem. Wildlife species are often vulnerable to the effects of disturbance during their breeding periods and juvenile stages of offspring. Damage to or destruction of ecosystems and habitats, including deforestation, draining of wetlands and intensified or unsustainable use of land can be minimized by introduction of ecotourism.

### 6.1.3 Pressure of tourist on natural resources

There has been significant growth in tourist volumes in the last few years. Figure 3 indicates that in 2002 West Bengal has attracted approximately 17 million tourists. However, West Bengal has so far attracted a very small portion (about 4 %) of the total annual tourist flow to the country in spite of abundant natural and heritage resources (Karmakar, 2011) <sup>[5]</sup>. Hence, there is substantial room for growth in this sector. Substantial Domestic tourists come from neighbouring states like Orissa, Jharkhand, Bihar and the North East states. It may be seen that the state has been receiving around 3.7 percent of the domestic tourist. The position with foreign tourists is a little improved with West Bengal accounting for over 8 percent of the foreign tourists. As the forest areas are the main attraction and destinations of foreign and local tourists, it creates tremendous pressure and hampers the privacy of wild flora and fauna.



Source: www.wbgov.com, India Tourism Statistics 2004, India tourism Statistics 2005

Fig 3: Tourist inflow in West Bengal

### 6.1.4. Livelihood pattern of local people

Main threats are coming from the unplanned anthropogenic activities which increased day by day and hamper the natural shelters of various birds in the study area. The peripheral areas of these natural reserves are transformed drastically as a result livelihoods of local peoples are depending upon the forest

resources. They intrude wild zones and interfere on the wild habitat. As majority of people of the peripheral areas of these natural habitats are practicing the agricultural and aquaculture activity by livestock farming including forest grazing creates slow but significant deterioration of avifauna. The farmers use pesticides and fertilizers which prevents



avifauna moving around the agricultural fields or the water bodies. Other form of uses of biological resources like hunting and collecting terrestrial animals - intentional use (species being assessed is the target), logging and wood harvesting - unintentional effects, subsistence/small scale, fire and fire suppression - increase in fire frequency / intensity, transportation and service corridors roads and railways leads

to moderate to rapid deterioration or very rapid to severe deterioration of avifauna as well as other wild lives which is expressed in table 2. These are the threats to the survival of the natural assets. Sustainable resource utilization and conservation of resources for future generation is required for the common benefits of man and the nature.

**Table 2:** Threats/ pressures to the existence of avifauna

Threats/ pressures to the existence of avifauna					
Threat Level 1	Threat Level 2	Timing	Scope	Severity	Result
Agriculture and aquaculture	Livestock farming and ranching (includes forest grazing) - small-holder grazing, ranching or farming	Happening now	Majority/most of area/population (50-90%)	Slow but significant deterioration	High
Biological resource use	Hunting & collecting terrestrial animals - intentional use (species being assessed is the target)	Happening now	Small area/few individuals (<10%)	Slow but significant deterioration	Low
Biological resource use	Hunting & collecting terrestrial animals - persecution/control	Likely in short term (within 4 years)	Small area/few individuals (<10%)	Very rapid to severe deterioration	Low
Biological resource use	Logging & wood harvesting - unintentional effects: subsistence/small scale	Happening now	Small area/few individuals (<10%)	Slow but significant deterioration	Low
Natural system modifications	Fire & fire suppression - increase in fire frequency/intensity	Happening now	Small area/few individuals (<10%)	Slow but significant deterioration	Low
Transportation and service corridors	Roads and railways	Likely in long term (beyond 4 years)	Small area/few individuals (<10%)	Moderate to rapid deterioration	Low

**Source:** <http://www.birdlife.org/datazone/sitefactsheet>, modified by the author

Gorumara, Buxa and Jaldapara being major tourist attraction in North Bengal and resulting disturbance together with the pressure for livelihood development of local people are forcing the conversion of this region. Due to the intense anthropogenic influence most of the forest has already been destroyed here and even increasing demand to tourism are engulfing the remaining. This study reveals that the bird diversity of these three different areas of north Bengal that are subjected to various degree of pressures from human disturbances. So protection of rich flora and fauna especially avifauna are very essential to protect our existence as a part of this rich biodiversity around us.

**6.1.5 Protection of flora and fauna**

In place of commercial tourism if eco-tourism approach can be adopted then the natural habitat of flora and fauna can be checked from destruction. The main options for managing the pressure of tourists are to reduce visitation, modify visitation, redirect visitation, and prevent visitation. Unchecked tourist activities at sites may have significant detrimental effects on wildlife and ecology. The cumulative effect may intensify permanent degradation, thereby compromising the viability of the sites as tourist destinations.

**6.1.6 Role of Government and other agencies**

Eco tourism can contribute to conservation through various ways. Proper environmental management and planning and awareness among the tourists can be generated to accelerate the conservational activities. Protection and preservation of wild habitats and precious wild flora and fauna is most

important activity. Financial Contributions may be crafted for promotion conservation activities. Government agencies, conservation NGOs and tourism industry bodies should work together to strategically develop mechanisms for enhancing links between eco- tourism and conservation. Governments should encourage and support wildlife tourism attractions becoming actively involved in research on their target species.

**7. Conclusion**

As concluding note it can be stated that awareness should be raised among the tourists and local people regarding ecological realities and about the promotion of ecotourism as well as preservation of natural environment and heritage. Local community should involve in development of ecotourism. Local people should aware about the importance of conservation of water resources so that sound eco-practices can be developed. Government of West Bengal have started planning for establishing eco-tourism spots in North Bengal namely Gajoldoba near *Teesta* Barrage and other places to minimize the impact of unplanned commercial tourism and to protect the natural beauty of pristine land. Other non-government organizations should come forward on issues relating to the conservation, research and restoration of the environment and encourage responsible tourism.

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