

A Brief Appraisal of Human Wildlife Conflict in Jalpaiguri and Alipurduar Districts of West Bengal

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Abstract- Human–Wildlife Conflict refers to conflict between wild animals and humans due to overlapping of human population and wildlife territory. The conflict leads to loss of life, injury of both humans and animals, loss of wealth and resources. Such interaction between human communities and wildlife is a matter of great concern due to its growing negative impact. Animals are bound to stray into human territory when forested areas, from where they acquire prey, are destroyed and corridors of their natural movement are encroached upon. Jalpaiguri and Alipurduar Districts of West Bengal are covered with dense forest and grassland and it is the shelter of many endangered species. But due to increasing human population and wildlife, depletion of green cover, decline in fodder of wild animals and developmental activities in protected areas; human wildlife conflict occurs in these Districts. This paper is an attempt to find out the nature, causes, consequences of human wildlife conflict in Jalpaiguri, Alipurduar District and to suggest some solutions to control the problem for biodiversity conservation.

Index Terms- Biodiversity, Developmental activities, Endangered species, Habitat degradation, Human Wildlife Conflict

I. INTRODUCTION

According to the World Conservation Union, Human Wildlife Conflict (HWC) occurs “when wildlife’s requirements overlap with those of human populations, creating costs to residents and wild animals. Direct contact with wildlife occurs in both urban and rural areas, but it is generally more common inside and around protected areas, where wildlife population density is higher and animals often stray into adjacent cultivated fields or grazing areas” (Distefano, 2005). Jalpaiguri and Alipurduar Districts have wildlife sanctuary, national park, elephant reserve, tiger reserve maintained in protected and reserved forest areas. Due to the increase of population, demand of resources, urbanization, increased agricultural and industrial activities; the occurrence of HWC is very common in these Districts.

II. RESEARCH ELABORATIONS

OBJECTIVES:

The objectives of the present study are as follows-

- To find out the forest resource base and nature of wildlife conservation of Jalpaiguri and Alipurduar District
- To analyze the causes, consequences and patterns of human wildlife conflict in these Districts
- To suggest some measures to deal with human wildlife interaction

III. METHODOLOGY AND DATABASE

The methodology has followed a number of stages. Secondary data is mainly used for the preparation of this paper. State Forest Report, District Census Handbook are mainly consulted to gather the data. Then relevant books, journals, papers are also referred. All the data thus obtained are analyzed, tabulated and represented through the paper. ArcGIS 9.3 has been used for the preparation of map.

IV. STUDY AREA

The study area includes Jalpaiguri and Alipurduar Districts of [Indian](#) State of [West Bengal](#). The latitudinal and longitudinal extent is 26° 16' to 27° 0' North latitude and 88° 4' to 89° 53' East longitude. Jalpaiguri District was established in 1869 in [British India](#). Division of Jalpaiguri District took place and thus eastern part of the District is named as Alipurduar during 2014 June. The study area is situated in the northern part of West Bengal and has international borders with [Bhutan](#) and [Bangladesh](#) in the north and south respectively and District borders with [Darjeeling](#) hills in the west and [Cooch Behar District](#) on the east (Fig 1).

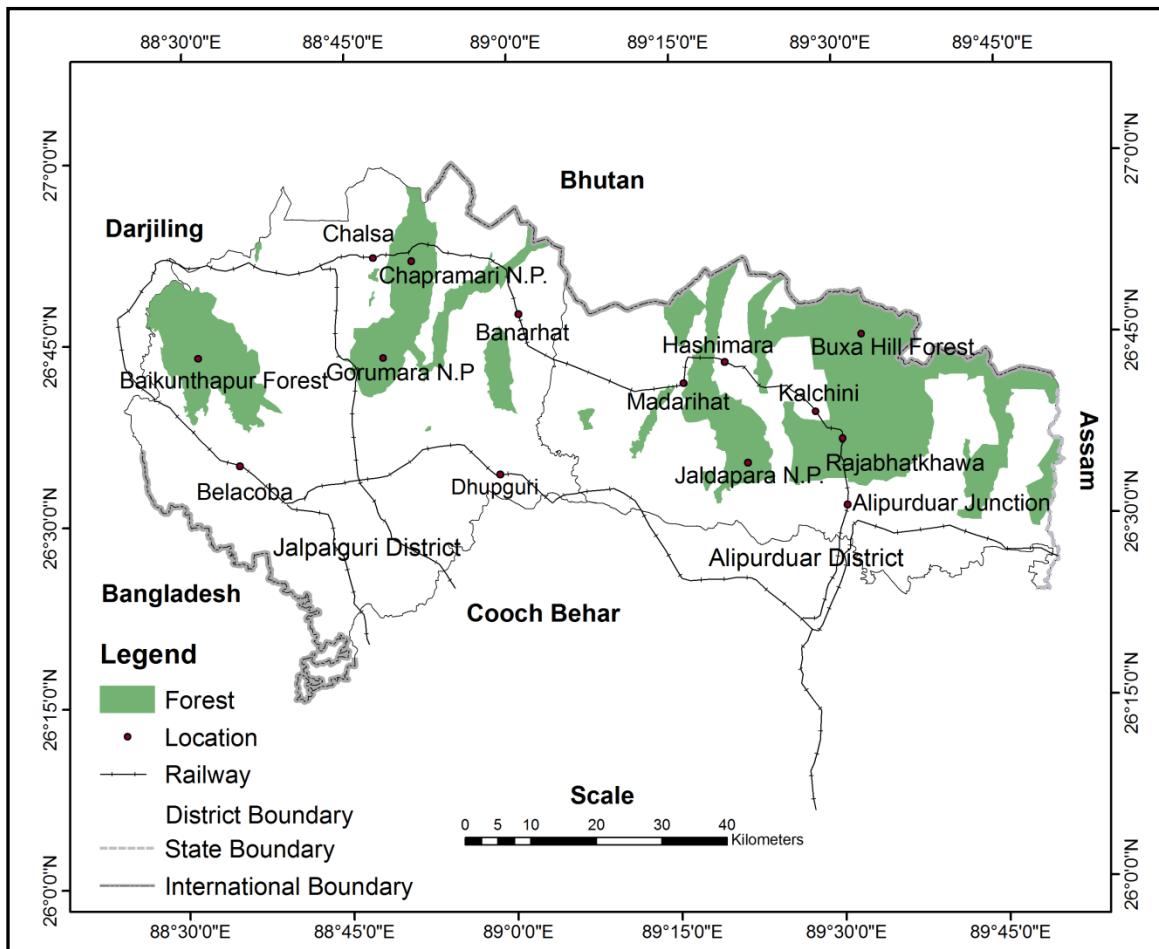


Fig: 1. The Study Area

V. FOREST COVER AND PROTECTED AREAS OF THE STUDY AREA

Jalpaiguri and Alipurduar District are only after South 24 Paraganas and Darjiling in terms of its combined percentage of total area under forest. About 28.75% of the area is under forest coverage which is much greater than the States average forest covered area (13.38%). According to the State Forest Report

(SFR) reserved forests are notified under the provisions of Indian Forest Act, 1927 having full degree of protection. In reserved forest all activities are prohibited unless specifically permitted. Protected forests have a limited degree of protection. There all activities are permitted unless prohibited. Unclassed forest is not under protected or reserved category and its status varies from State to State (Table-I).

Table I: Area (in sq km) under Forests by Legal Status in West Bengal, 2011-12

District/State	Reserved Forests	Protected Forests	Unclassed State Forests	Total Area
Jalpaiguri, Alipurduar	1,483	217	90	1,790
West Bengal	7,054	3,772	1,053	11,879

Source: State Forest Report (SFR), 2011-12

The study area includes 3 National Park (NP) namely Gorumara (79.45 sq km), Buxa(117.10), Jaldapara (216.51 sq km) and 2 Wildlife Sanctuary (WLS) namely Buxa (267.92 sq km), Chapramari (9.60 sq km). Buxa Tiger Reserve (Buffer Area- 370.2886 sq km) and Eastern Duars Elephant Reserve (Buffer Area-493.51sq km) are also included in the study area. There is presence of more than hundreds of village within the fringe areas and inside the protected areas which are vulnerable

to HWC. According to State Forest Report, West Bengal, 2006-07 there are 19 villages in the fringe of Gorumara NP, 2 villages inside the protected area of Jaldapara, 42 villages in the fringe area of Jaldapara, 8 villages inside the protected area of Buxa and 33 villages in the fringe area of Buxa Tiger Reserve (BTR) East and West (Data Source: SFR, 2011-12).

VI. RESULTS AND FINDINGS

CAUSES OF HWC:

HWC is a common phenomenon in the study area due to the following reasons-

A. Population Growth:

The total population of the study area has increased from 3401173 to 3869675 and population density has also increased from 546 persons per sq km to 621 persons per sq km from 2001-2011. The decennial growth rate of population is 13.77% in between the period of 2001-2011(Census, 2001, 2011). Landuse change and transformation of forest areas into settlement are done to meet the needs of growing population. This has given rise to HWC.

B. Encroachment of Forest area:

Transformation of forest land for cultivation, developmental activities, built up area is the main reason behind such encroachment. Thus natural habitat of wildlife gets lost and in order to survive, wildlife move into human territory. In the year 2012 about 226 hectares of forest land is encroached upon in the study area (Table-II).

Table-II: Area under encroachment of forest in hectares

Forest Division	Area (Hectare), 2006-07	Area (Hectare), 2011-12
Baikunthapur	-	25.96
Jalpaiguri	141.200	103.387
Buxa Tiger Reserve (East)	98.514	98.514

Source: SFR, 2006-07&2011-12

Table-III: Degraded notified forest

Year	UNIT (in Sq Km)
2006-07	13.43
2011-12	23.32

Source: SFR, 2006-07, 2011-12

C. Habitat fragmentation:

“Habitat fragmentation is a process where large, continuous area of habitat is both reduced in area and divided into 2 or more fragment by roads, field, towns, canals, powerlines” (Sharma, 2016). This leads to forest degradation and loss of habitat of species. About 23.32 sq km of forest degradation is found to occur in 2011-12 which is greater than 2006-07 statistics (Table-III).

D. Stochastic Incidents:

They include breaking out of forest fire which not only leads to interaction of man and animal but also destruction of natural habitat of species and loss of biodiversity. In the year

2011-12 about 103 cases of forest fire are found to occur in the study area (Table-IV).

E. Developmental activities:

Diversion of forest land for developmental activities like irrigation project, hydelpower project, mining project, construction of road, laying of railway line and transmission line or pipe line leads to destruction of forest land. The 182 km long New Jalpaiguri/ Siliguri-Samuktala Road Line was constructed as part of the Assam Rail Link project in 1948-50. After conversion to Broad Gauge (BG) it was re-opened on 20th November 2003. The number of elephant death increased since then (Table V).

Table-IV: Forest Fire Incident

Division	No. of cases	Area affected (ha.)
BTR (E)	6	23.5
B.T.R.(W)	87	235
Baikunthapur	10	2.0

Source: SFR, 2011-12

Table-V: No. of elephant death

Location	Before BG	After BG
BTR	2	12
Jaldapara	3	2
Madarihat	0	3
Banarhat	0	13

Source: Das, 2013

F. Reduction in the availability of natural prey/food sources:

This causes wild animals seeking alternate sources. The new resources created by humans draw wildlife which results into conflict. Especially the wildlife gets attracted to the domestic animals and thus HWC takes place frequently in the villages near forested areas.

HWC INCIDENTS AND THEIR IMPACT:

Human-wildlife conflict leads to injury and loss of life of humans, crop damage, livestock destroy, damage to human property and destruction of habitat. Huge amount of compensation is provided by the Government to tackle the situation. During 2013 about 29 people were killed and 149 people were injured due to the conflict between man and animal according to the Government records. A total of 328 livestock were also killed, 11 huts were damaged and 2620.91 hectares of crop were damaged by the said incident. Government had to pay Rs. 13833794 as compensation to meet the vulnerability (Table-VI). Thus huge amount of money is expended for such incidents

by the Government which could be used in some other sector for development of the society.

Table-VI: Payment of Ex-gratia Relief for animal depredation, 2013

HWC impact	Gorumara	Jaldapara	Buxa TR	Baikunthapur
Persons Killed (No.)	18	3	3	5
Persons Injured (No.)	123	10	16	-
Compensation paid for human life & injury (Rupees)	2988087	596464	620977	276128
Livestock Killed (No.)	2	174	152	-
Compensation paid for Livestock Killed (Rs.)	1100	157200	135630	-
Hut damage (No.)	42	370	466	637
Compensation paid for Hut damage (Rs.)	90000	486200	1017320	1049385
Crop damage (Hectares)	22.65	329.67	1890	378.59
Compensation paid for crop damage (Rs.)	169900	696300	2590970	2840133
Total Compensation (Rs.)	3229087	1936164	4502897	4165646

Source: Chakraborty, 2013

A. Human-Elephant:

Elephants are social animal and they move with a big herd and gather nutritious calorie rich food from forests like potato, paddy, sugarcane, cabbage etc. Consequent demand of land for agriculture, industry and settlement leads to fragmentation of their habitat. Fragmented habitat gives them the opportunity for crop raiding.

Elephants have wide home ranging from 100-1000 sq km thus obstruction to their traditional migration path cause Human-Elephant conflicts resulting into damage to agricultural crops, property, household and injury or mortality to both humans and Elephants. Conflicts particularly takes place during harvest season coinciding with the period after monsoons (Bhattacharya, 2013). “Major Elephant movements take place through the tea gardens. Almost 90% tea gardens of Jalpaiguri are within the zone of conflict. The tree stands in tea garden provides cover and some amount of fodders to the Elephants. Haphazard labour line distribution and their activities for crop cultivation and brewing rice alcohol are the major problems for Man-Elephant conflict in North Bengal” (Das, 2013). According to SFR 2011-12, chemical immobilisation was done for 5 Elephants when they were hit by train in Jalpaiguri division, BTR East and Totopara. Chemical immobilization is the technique by which drugs are used for capturing, transferring and treating the wild animals during HWC incidents.

B. Human-Leopard:

“Change in land use pattern especially for enhanced tea plantation has affected Leopard population extremely. Encroachment of forest land has brought Leopards close to human habitats. Between April 2001 and March 2008 most of the Leopard attacks have taken place in tea gardens in western Dooars (90% of the 243 leopard attacks). Tea gardens act as

chief places for conflicts as Leopards can prey upon cattle reared by tea garden workers” (Chakraborty, 2015). Leopards consume boars, deers, birds and rodents mostly. They enter into villages to attack the domestic animals like cow, goat, dogs, cats etc. Sometimes they can fulfill their needs and sometimes they get injured by humans. Leopards are cunning in nature that is why chemical immobilization is rarely successful for immobilizing them.

C. Human-Bison:

Bisons stray into human habitat due to inadequate fodder availability in the forest. This leads to Human-Bison conflict where both sides get affected. Bisons generally feed on herbs, young shoots, flowers, fruits etc. Deforestation, encroachment results in movement of them into human habitat.

In the areas of Jalpaiguri, Aliipurduar, mainly during November to April, Gaurs (Indian Bison) come out of forests and tend to graze in adjacent crop fields where they are surrounded by people and stoned or driven. Then the animals violently attack the people. The people were killed and injured in many such incidents. Forest staffs have been also seriously affected in several capture operations. In most cases the animals were so exited and exhausted due to continuous disturbance by people that they are prone to cardio-respiratory failure soon after immobilization. Only in cases of BTR and Gorumara the staffs were able to successfully rehabilitate Gaurs after immobilization and capture (Chowdhury, 2014). During crossing railways line Bisons are often hit by train.

On December 16, 2012 a Gaur died at Chapramari Wildlife Sanctuary after being hit by a speeding train (Bhattacharya, 2013).

D. Human-Rhino:

Jaldapara NP has a population of 149 Rhinos and there is smaller population of 3 Rhinos in Gorumara NP and adjacent Chapramari Santuary. In 2009-10 Rhinos from Gorumara crossed the Teesta River and migrated to Mahananda Santuary near Siliguri. There are 12 Rhino straying incidents recorded between 2009 and 2013 and 43 cases of immobilization reported from 1984-2013 (Chowdhury, 2014).

Rhinos generally feed on fruits, stems, twigs, grasses and leaves and they move in their habitat in search of plants mostly. Search of food brings them close to the humans. According to SFR, 2011-12 Rhino tranquilization was done for 4 Rhinos in Jaldapara and Gorumara subdivision when they entered into human inhabited areas for searching of fodder.

Table-VII: Recent incident of HWC that lead to animal injury or death

Date	Area	Animal strayed	Animal Injured (No.)	Animal death (No.)
21 st October, 2010	Khokhla Basti	-	Bison (2)	-
16 th June, 2011	Diana Tea Garden	-	Bison (8)	-
25 th October, 2012	Banarhat	Bison straying	-	-
7 th December, 2012	Banarhat	Bison straying	-	-
4 th February, 2013	Premganj Char	Bison straying	-	-
22 nd March, 2015	Dhupjhora, Gorumara	-	Bison (3)	-
19 th July, 2011	Salugara	-	Leopard (11)	-
22 nd December, 2012	Premganj	Leopard straying	-	-
14 th January, 2013	Nagrakata, Dooars	Leopard straying	-	-
28 th January, 2013	Hakimpara	Leopard straying	-	-
11 th June, 2014	Limbu basti, Dooars	-	-	Elephant (1)
5 th Feb, 2015	Kathambari market	-	-	Elephant (3)

Source: Bhattacharya, 2013 & Chakraborty, 2015

VII. STRATEGIES TO PREVENT HUMAN WILDLIFE CONFLICT IN THE STUDY AREA

- Fencing is an old age strategy to deal with HWC but if cement fences with metal gates or electrical fencing can be managed then the effect of HWC can be controlled efficiently.
- Eco-development is the most important strategy to deal with HWC. Local people especially women of protected areas can be involved in planning and management in partnership with Government.
- Alternative sources of fuel and fodder can be developed so that forest dependent people are not affected by HWC frequently. Women must be given greater opportunity by the Government to generate income independently.
- Compensation is generally given by the Government as a post HWC strategy but the gap between actual loss and compensation value must be decreased. With economic compensation, food, fuel can be provided to the affected villagers.
- Local capacity building is necessary for the villagers to reduce HWC impact. Physical (technology, infrastructure), financial (employment, savings), social (group formation) and human (knowledge) capacity building should be done.
- Number of forest guards must be increased to reduce accidents in forest. Forest workers can wear masks on the back of their heads to prevent sneak attacks.
- The police and forest department can work together during wildlife rescue operation so that the work can be carried out perfectly.
- Medical knowledge and training is very important for the staffs, those who carry out the operation of chemical immobilization. If it is done without expertise then it may cause death of animals. Implementation of improper dose of drugs can harm wildlife.
- Limitation of developmental projects is necessary near the forest area by implementation of laws for wildlife protection.
- Solar panel light in the fringe areas must be installed to prevent entrance of wild animals into localities. Automatic light machines can be used which flash beams of light randomly in all directions. Animals generally avoid such lights.
- The villagers must avoid going to open fields to excrete. Animals can easily track them by the smell of their urine. Thus toilet facility is must for villagers to stop conflict.
- Wastes must be disposed properly by the villagers in a particular place. Domestic animals often move near garbage and thus it becomes very easy or the predator to track its prey.
- Finally some smarter ways to fight wildlife can be used such as mobile technology, cyber tracker, metal scanner, radio frequency identification trap can be used to track movement of wildlife.

VIII. CONCLUSION

Wealth, literacy, education, employment decreases the dependence of household members on the forest. Thus those people do not want coexistence with forest and they want to stay away from wildlife. The poorer sections have very few alternatives so they depend on forests for fuel wood, fodder, water, fibers, thatch and grass. Thus coexistence is their basic requirement for them. Now a day's urbanization, developmental activities are harming the nature in such a way that wise use of resources is must. Maintenance of forest cover, creation of awareness among people, policy changes regarding forest, wildlife and community based natural resource management is very important. The best way to do away with the incidence of HWC is maintenance of forest cover and protected areas efficiently and controlling HWC in a smart way.

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