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Human-Animal Conflicts in Northern West Bengal: Losses on both sides

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ABSTRACT

For last few decades human-animal conflicts post a great threat to both wildlife and human existence. In West Bengal most of the encounters between human and animal is recorded from the northern districts. The study shows that although the stretch of forestry area is relatively unsatisfactory compared to the desired level , however, there has been an increase in population of some flagship species viz., Indian bison, Indian leopard, Indian elephant in recent times .This increase in wild population is due to imbalance in ecological food-chain. Increment in wild population and reduction of forestry area due to several reasons (viz., encroachment, human development etc) has increased the chances of human-animal conflict cases. The main objective of this study is to present the current status of forestry area, the population status of Indian bison, Indian leopard, Indian elephant and the latest scenario of human-animal conflict in the districts of Coochbehar, Jalpaiguri (including newly formed state of Alipurduar) and Darjeeling. The study also shows the huge amount of human life-loss and revenue loss each year in part of central and state government for providing ex-gratia relief owing to wild animal depredation.

Key words: *conservation, flagship species, human-animal conflict, northern districts, West Bengal.*

INTRODUCTION

The state of West Bengal stretches from the Himalayas in the North to Bay of Bengal in the south covering an area of 88752 square km. Out of its total geographical area, 13.38% includes the recorded forest category which is far less than the national figure of 23.38%. Of the total forest area of West Bengal, 59.38%, 31.75% and 8.87% are included under reserved, protected and un-classed forests respectively. Furthermore, protected areas comprise 3.26% of its total geographic area consisting of 15 Wildlife Sanctuaries and 6 National Parks, 2 Tiger reserves and 2 Elephant reserves.[1]

Habitat degradation, Encroachment of forests, habitat losses, and developmental activities like construction of roads and railway lines and increasing population of both human beings and wild animals, are bringing human and wildlife in close proximity resulting in many human-wildlife conflicts (HWC) in the state. This scenario is most prominent in Terai and Dooars region of Northern Bengal, as it houses most of the protected areas of West Bengal.

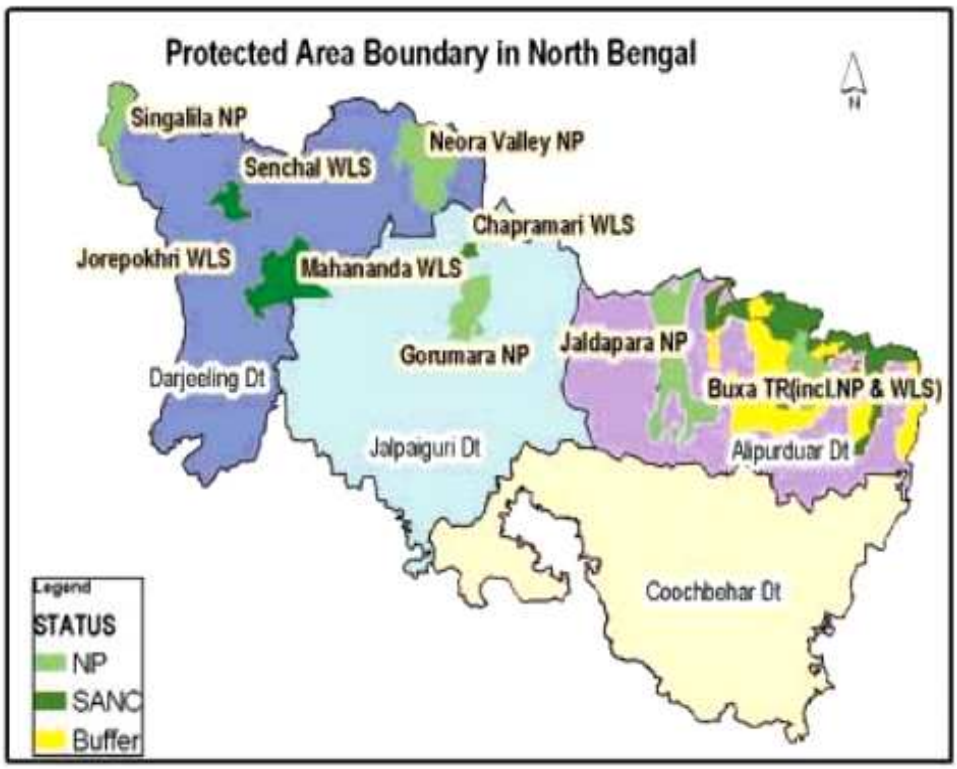
Although in most of the cases the conflicts and casualties are projected in an animo-centric orientation, emphasizing the deaths and depletions of wildlife, however, in recent years, there have been a huge life and property loss in part of human beings as well. Hence, the aim of this study is to highlight some anthropo-centric angles of Human-Animal Conflict (HAC) in the northern districts of West Bengal, projecting the extent of human casualties in last few years in the region and also suggest some remedies.

STUDY AREA

The entire study was conducted in the Terai and Dooars region of Northern West Bengal which covers the districts of Darjeeling, Jalpaiguri, and Coochbehar (Figure1).

The newly formed Alipurduar district is taken as a part of Jalpaiguri district as separate data were not available. The study area covers 5 wildlife sanctuaries, 5 national parks and 1 reserve forest of the region (Table:2).

Fig.1: Northern districts and protected areas of West Bengal



MATERIALS AND METHODS

The entire frame of the study has been categorically built on both primary and secondary data. Data for this study were obtained from from various sources like forest department records, newspaper cuttings, railway reports, forest annual reports (2009-2014) and personal field visits at conflict sites, aimed at a broader survey of wildlife in general in different areas of North Bengal, India. These studies examined the presence, distribution, and status of different species of wildlife, especially elephants (*Elephas maximus indicus*), Indian bisons (*Bos gaurus*), Indian leopards (*Panthera pardus fusca*) etc. The fieldwork also recorded conflicts between humans and animals and casualties thereof. Efforts were made to interview the villagers, forest staff, and hunters/ poachers who had experienced conflicts with wild animals.

RESULTS AND DISCUSSIONS

Forest Area in Terai and Dooars region of Northern West Bengal

The northern part of West Bengal covering the Dooars and Terai region includes three districts viz. Jalpaiguri, Darjeeling and Cooch Behar as shown in Figure-1.

Jalpaiguri has the largest geographical area of 6,227 sq. km (the newly formed Alipurduar district is included in Jalpaiguri,as no separate data was found), followed by Cooch Behar (3,387 sq. km) and Darjeeling (3,149 sq. km). Recorded forest areas, however, do not follow this form, Cooch Behar has the least area under forest, (only 57 sq. km i.e., miniscule 1.68% of the geographical area of the district).Although Jalpaiguri has more recorded forest area (1,790 sq. km) than Darjeeling (1,204 sq. km), in respect to their geographical areas, district Darjeeling is more forested (38.23%), compared to Jalpaiguri (28.75%) [1]. Most surprising fact is observed for the Cooch Behar district, which is almost similar in size to Darjeeling but lags far behind in terms of the total area under forest. Table 1, 2 and Figure 2 sums up the total scenario in the three northern districts:

Table 1: Current Status of Forestry Area in Northern Districts of W.B [1]

Forestry areas	Districts			West Bengal (total) (sq km)	India (total) (sq km)
	Jalpaiguri	Darjeeling	Cooch Behar		
Total geographical area	6227	3149	3387	88752	3287240
Reserved Forests	1483	1115	-	7054	423311
Protected forests	217	-	42	3772	217245
Unclassed state forests etc	90	89	15	1053	127881
Total forest area recorded	1790	1204	57	11879	768437
Total forest area in %	28.75	38.23	1.68	13.38	23.38

Fig 2: Comparison of forestry area in Northern districts of West Bengal

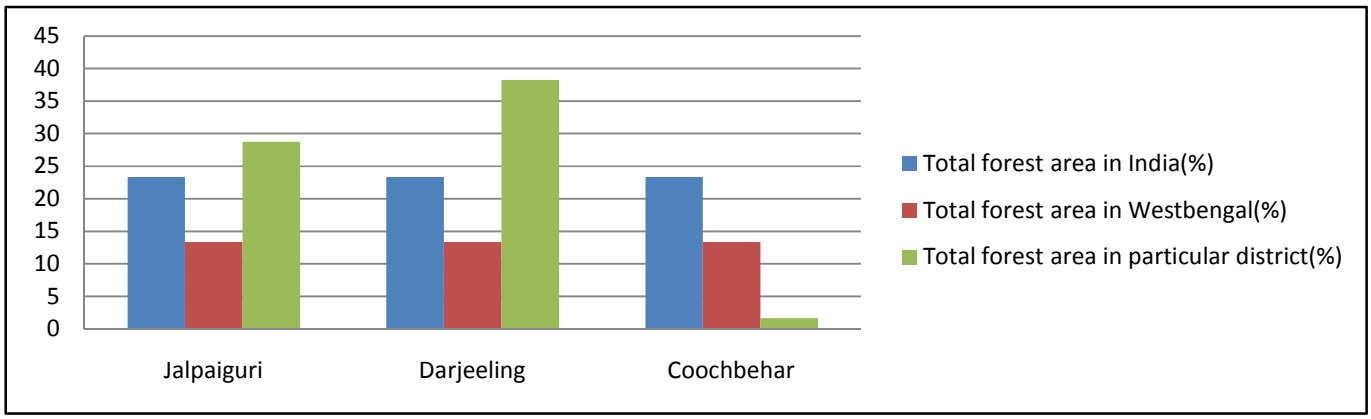


Table 2: Protected Areas in Terai and Dooars [2]

Conservation areas	District	Biogeographic Zone	Area (sq. Km)
WILD LIFE SANCTAURY (WLS)			
Jorepakhri WLS	DARJEELING	2C	0.04
Mahananda WLS		7B	158.04
Senchal WLS		2C	38.88
Chapramari	JALPAIGURI	7B	9.60
Buxa		7B	314.52
NATIONAL PARK(NP)			
Singalila NP	DARJEELING	2C	78.60
Neora Vllaey NP		2C	159.8
Buxa NP	ALIPURDUAR	7B	117.1
Gorumara NP	JALPAIGURI	7B	79.45
Jaldapara NP	JALPAIGURI AND COOCHBEHAR	7B	216.5
RESERVES			
Buxa Tiger Reserve	ALIPURDUAR	7B	370.29 (CORE AREA)

Status of Major Flagship Species in Protected Areas

A flagship species is any species selected to act as an ambassador, icon or symbol for a defined habitat, issue, campaign or environmental cause. By focusing on, and achieving conservation of that species, the status of many other species which share its habitat or are vulnerable to the same threats - may also be improved. The major flagship species in the protected areas of Terai and Dooars include - Indian Bison, Indian Leopard and Indian Elephant. It has been recorded that there has been a steady increment in the count of these animals in the last few years in the protected areas of the Northern districts, despite frequent man-animal conflict. The data is represented here:

Indian Bison

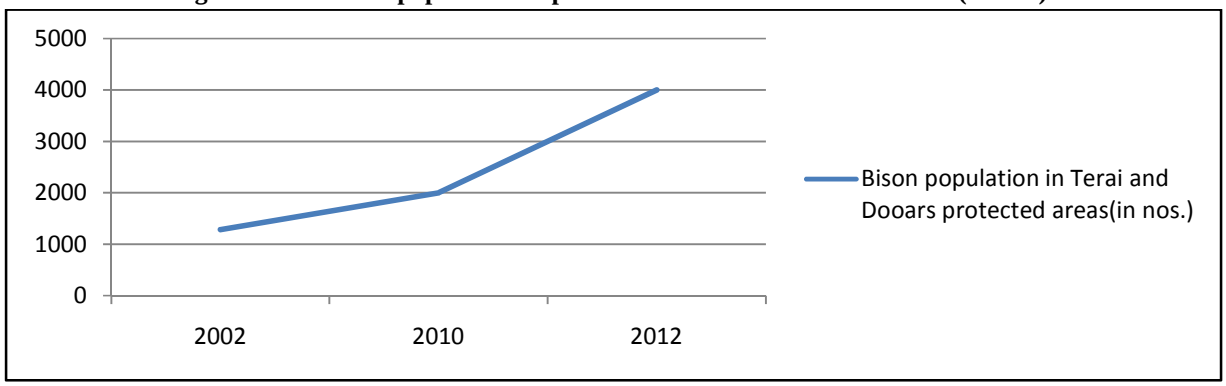
The Indian bison (*Bos gaurus*), also known as the Gaur, is a large bovine native to South Asia and Southeast Asia. Traditionally, three subspecies of Indian bison have been recognized: *B. g. readei, B. g. hubbacki, and, B. g. gaurus*. *Bos gaurus gaurus* is native in India, Nepal, and Bhutan. The species is listed in vulnerable category (under Criteria A2cd+3cd+4cd) on the IUCN Red List since 1986, as the population decline in parts of the species' range is likely to be well over 70% during the last three generations.[3] The Indian Wildlife Protection Act of 1972 includes it under Schedule-I giving highest priority to its conservation. In India, the population decline of the species is considerably lower as compared to other Southeast Asian countries. The Indian bison population in India occurs in fragmented areas. The estimated population of Indian bison in India was between 12,000 and 22,000 according to the 2008 IUCN report[3]. According to State forest reports, number of bisons was 1,261 in northern West Bengal as per 2002 census.[4] In 2009-10 there were more than 901 bisons only in Gorumara NP and Chapramari WLS (State forest annual report 2013-14),while in 2013-14, 782 bisons were found only in Buxa tiger reserve [2] .The census data cited by The Telegraph shows bison population to be around 2,000 in the year 2010 which in 2012 further rose to around 4,000 in all reserves of northern West Bengal [5]. Hence, there has been a steady increase in Indian bison population in the protected areas of Northern districts of West Bengal, especially, in Gorumara NP, Chapramari WLS and Buxa tiger reserve.The increase in bison population in Terai and Dooars region of Northern West Bengal is depicted in Figure 3 and Table 3.

Table 3: Year wise Indian Bison Population in North Bengal

Year	Bison population (in North Bengal)
2002	1261*
2010	>2000(approx.)**
2012	> 4000(approx)**

*according to state forest report (2013-14) **according to *The Telegraph* report

Fig. 3: Indian Bison population in protected areas of Terai and Dooars (in nos.)



Indian leopard

The Indian leopard (*Panthera pardus fusca*) is a subspecies of leopard, widely distributed on the Indian subcontinent. The species *Panthera pardus* is classified as Near Threatened by IUCN since 2008 as populations have declined following habitat loss, fragmentation, human-leopard conflicts, poaching etc. Still,in India, 9,844 leopards are being estimated in 2001 census[6]. However, according to a recent report, currently in India, they are over 11,000 in numbers[7].

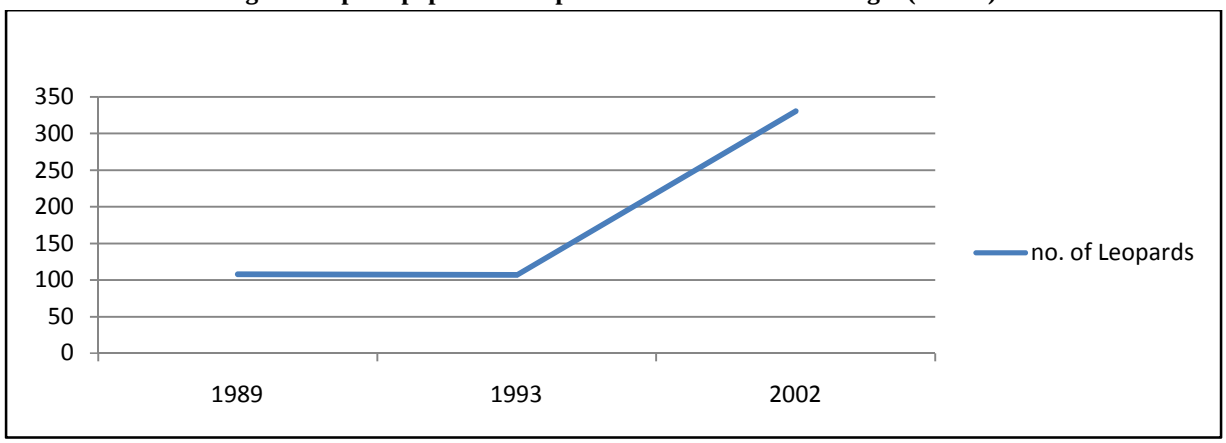
Leopard is a highly protected species in India as it is included in schedule I of the Wildlife Protection Act of 1972. Leopard is often found in the tiger reserves in India, although no reliable census report has been done yet. Poaching and human-leopard conflict scenarios are affecting its numbers affecting its conservation measures.

Leopard's natural traits e.g. high adaptability and the ability to live in wide range of habitats bring it close to the human settlements, mostly in search of prey, resulting in human-animal conflicts[7]. According to the the census (2004) data of the West Bengal forest department, maximum leopards are present in the forests of Gorumara(43) followed by Jaldapara (28) and Mahananda (26).However , a census report in 2012 reports 105 leopards in Buxa Tiger reserve-West itself.[2] Hence,there has been increment in number of bisons in the area in last two decades. Table 4 and Figure 4 depict the increase:

Table 4: Yearwise Indian Leopard Population in West Bengal[2]

YEAR	NO. OF LEOPARDS (in West Bengal)
1989	108
1993	107
2002	331

Fig. 4: Leopard population in protected areas of West Bengal (in nos.)



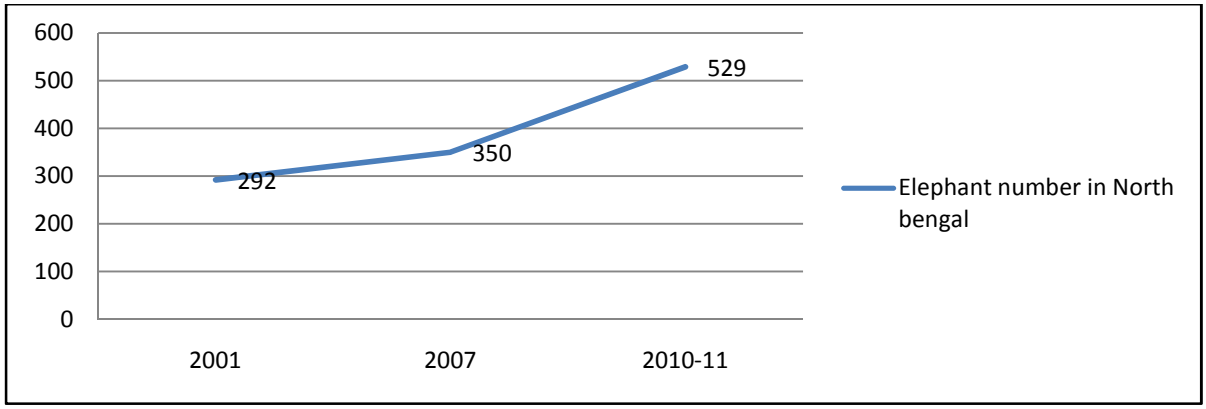
Indian elephant

Elephas maximus indicus, or the Indian Elephant is enlisted on the Red List category as 'Endangered'. The Indian elephant is a schedule I species in India under the Wildlife Protection Act of 1972. Its viability is threatened due to mainly loss of habitat, habitat degradation and fragmentation, poaching and human-elephant conflicts. The anthropogenic developmental activities, expanding populations of the human beings, reducing the forest areas have made the species concentrate in isolated populations. This has mainly resulted in elephants invading human habitats resulting in frequent human –elephant conflicts. The species, in India, is now confined to four regions viz. north-eastern India (which includes the portion of northern West Bengal), Central India (which includes the portion of southern West Bengal), north-western India and southern India[8]. Due to isolated and confined population of Elephants in these areas, proper planning and execution of Project Elephant is hampered .The number of elephants in West Bengal, according to 2010-11 census is estimated to be about 647.[2] The annual forest report of the state depict the elephant number to be steeply increasing, as shown in Table 5 and Figure 5:

Table 5: Year wise Indian Elephant Population in West Bengal[2]

Year	Elephant population	
	NORTH BENGAL	SOUTH BENGAL
2001	292	-
2007	350	123
2010-11	529	118

Fig. 5: Elephant number in North bengal



Human-Animal conflicts (HAC)

a. Background to HAC

HAC arises from negative interactions between humans and wildlife, both directly and indirectly[9]. Human-wildlife conflict can be defined as "any interaction between humans and wildlife that results in negative impacts on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment"[10]. The conflict eventually results in detrimental effects on both wild animals as well as humans. Apart from economic losses suffered by the human population like destruction of agricultural crops, loss of cattle through predation by carnivores, damage to immovable properties etc. death on both sides take the extreme form in these conflict scenarios. Along with wild life, each year huge number of human life loss takes place in these fall-outs.

b. Reasons for HAC

Every animal species requires a specific habitat consisting of a single type or mixed vegetation providing all necessary resources for survival .In recent years human-animal conflict has gone up steeply owing to the following reasons: increase in human population; land use transformations, developmental activities, species habitat degradation and fragmentation; growing interest in ecotourism and increasing access to nature reserves; increasing livestock population and competitive exclusion of wild herbivores; abundance and distribution of wild prey; stochastic events like fire and most importantly increasing wildlife population as a result of conservation strategies. In addition to life losses and economic losses; HAC has serious dimensions for bringing change in human behavior. Decrease in appreciation and increase in negative attitude towards wildlife has serious detrimental potential to impact the natural system of coexistence.

c. Human Casualties Due To HAC

- **Human Vs Indian Bison**

The number of Indian bisons in the forests of northern districts of West Bengal has increased drastically bringing about frequent human-bison conflicts in the area. The main reason for this increase is food-chain imbalance. The number which was nearly 2,000 in all the reserves of northern West Bengal in year 2010 increased to 4,000 in 2012.Recent report says the increase in bison population is related to decrease in predator population. Tigers, the prime predators of bisons, although are present in Buxa Tiger reserve and Jaldapara WS,they are not found in Gorumara NP and Chapramari WS in the Dooars. Hence, bison population is mainly concentrated there. The fodder available there is not sufficient to sustain the increased number of bisons there, hence forcing them to forage into the human habitats, increasing the chances of human-bison conflicts[9] .The fall-outs between villagers and Indian bisons has led to damages on both sides. Table 6 highlights some of them[11]:

Table 6: Some recent incidences of human-bison conflict in North Bengal

DATE	AREA	CASUALTIES	
		INJURED	DEAD
21 Oct 2010	Khokhla Basti,Jaigaon,Jalpaiguri	2	-
24 Feb 2011	Marichbari, Amtuli Hat Gopalpara and Kankanpuri,Coochbehar	6	-
16 June 2011	Diana Tea Garden,Jalapiguri	8	-
22 March 2015	Dhupjhora,Gorumara NP,Jalpaiguri	3	-

- **Human Vs Leopard**

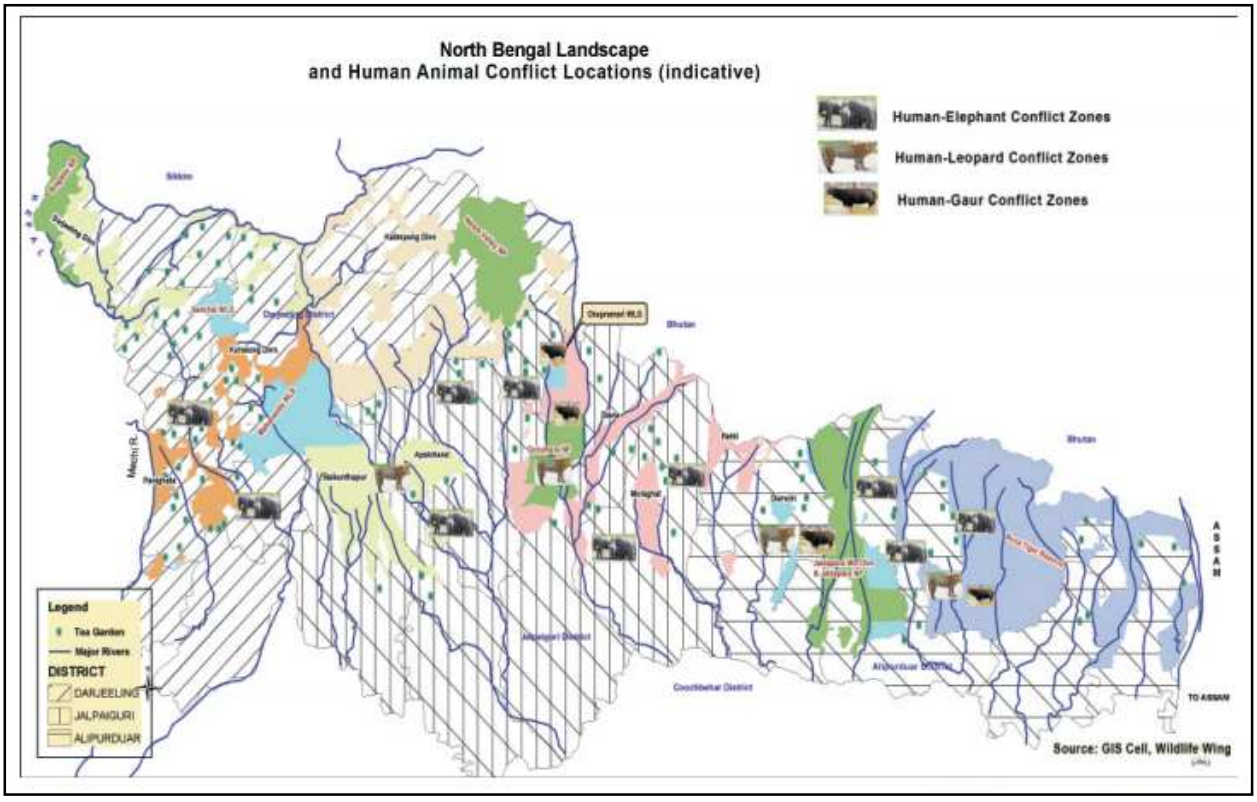
Changes in land use pattern especially for enhanced tea plantation has affected leopard population extremely. Encroachment of forest land has brought leopards close to human habitats.

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[12]. A recent analysis of human-leopard conflict scenario in western Dooars also revealed that domestic animals like cattle, goats and dogs among others attract leopards to human settlement as these are easy prey compared to wild herbivores[13]. Moreover, leopards also use tea plants as shelters during giving birth. They have high instincts of parental care and thus protect their cubs. This makes them attack anyone who they fear of coming in the way of the cubs. Table 7 depicts some of the recent incidences [11]:

Table 7. Some recent incidences of human-leopard conflict in North Bengal

DATE	AREA	CASUALTIES	
		INJURED	DEAD
19 Jul 2011	Salugara, Jalpaiguri	11	-
28 Jan 2013	Hakim Para,Siliguri	2	-
26 Aug 2014	Prakash nagar,Siliguri	6	-

Fig. 6: Human animal conflict zones in North Bengal



- **Human-elephant conflicts:**

Elephants have wide home ranges, typically between 100 and 1000 km^2. Habitat fragmentation or obstruction to migration path brings about human-elephant conflicts resulting in damage to agricultural crops, property, household and injury and mortality to both humans and elephants 24. Cultivated crops are easy forage sources for elephants and more easy accessible as well. On an average, they annually affect crops over an area of 0.8 to 1 million hectares which in turn affect the livelihoods of at least 500, 000 cultivators [14]. Conflict levels are especially high in intensity in Northern part of West Bengal and are widely documented. In fact the region experiences one of the highest levels of human-elephant conflicts in Asia. They not only damage large areas of agricultural crops but also kill on an average 50 people each year [15].Some recent events of human elephant conflicts are depicted in Table 8:

Table 8. Some recent incidences of human-elephant conflict in North Bengal

DATE	AREA	CASUALTIES	
		INJURED	DEAD
11 Jun 2014	Limbu basti, Dooars	-	1
5 Feb 2015	Kathambari market , Jalpaiguri	-	3

Human Life Loss Due To HAC

Human casualties due to human animal conflict have been ever increasing since last few years. Among different interactions, highest casualties have taken place in conflicts between human and elephant, followed by leopard and bison. The extent of human casualties in last six years (2009-2014) in West Bengal is depicted in Table 9 and Fig 7 and 8 [2]:

Table 9 : Human casualties due to animal attack in West Bengal (2009-2014) [2]

	2013-14		2012-13		2011-12		2010-2011		2009-10	
	Injured	Dead	Injured	Dead	Injured	Dead	Injured	Dead	Injured	Dead
Elephant	114	67	1	69	-	67	-	96	-	82
Leopard	74	1	67	1	90	-	2	3	2	3
Bison	15	1	18	6	25	1	12	4	12	4

Fig. 7 : Human casualties due to animal attack in West Bengal during 2009-14

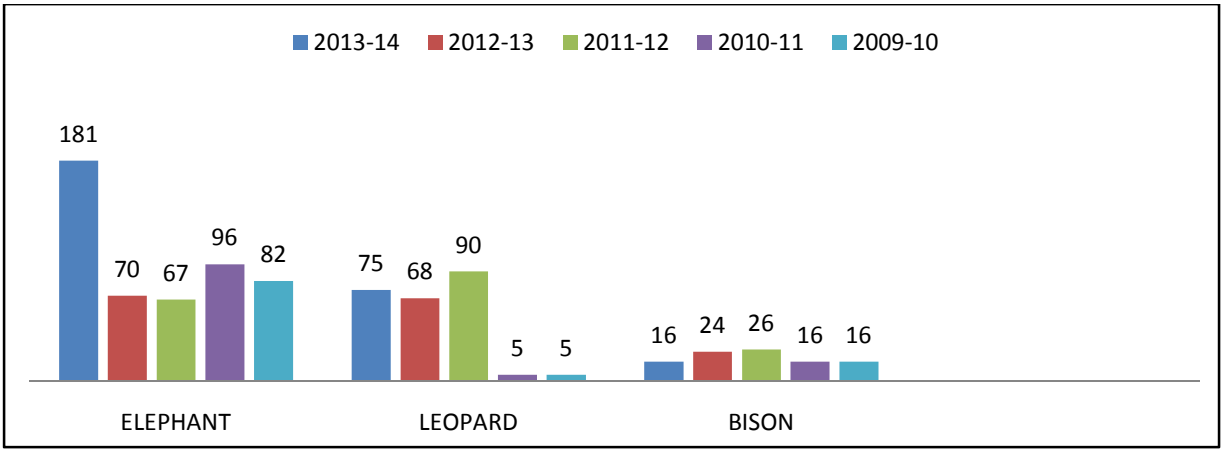
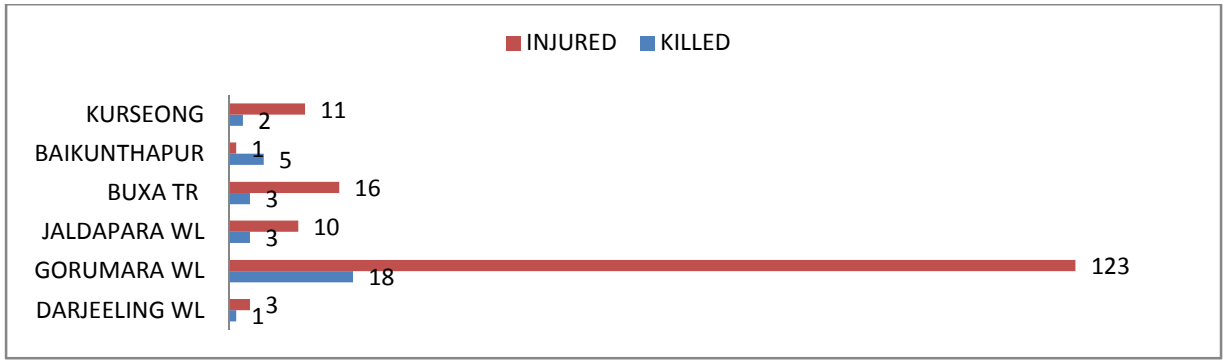


Fig. 8:Human casualties in different wild life divisions of North Bengal in 2013-14



Economic Loss Due To Human Animal Conflict

Not only in terms of life loss and injuries, these conflicts do cause a huge economical loss .Each year Central and State government has to pay a huge amount of money to pay ex gratia relief to the affected for wildlife depredation. In the latest State forest report it was reported that Buxa Reserve division paid the highest compensation (Rs. 4502897) , followed by Baikunthapur (Rs 4165646) while, Coochbehar wildlife division (Rs 23670) paid the least. Table 10 represents the compensation paid by different wildlife divisions in during 2013-14 preiod [2] :

Table 10: Payment of ex-gratia relief for wild animal depredation in West Bengal for the period of 2013-14 [2]

Division	Person killed (no)	Person injured (no.)	Compensation for human life & injury (Rs.)	Live stock killed/injured (No.)	Compensation paid for livestock killed (Rs.)	Hut Damage (no.)	Compensation paid for hut damage (Rs.)	Crop damage (Ha.)	Compensation paid for crop damage (Rs.)	Total Compensation (Rs.)
Darjeeling WL	1	3	199013	-	-	58	101100	1138	545940	846053
Gorumara WL	18	123	2988087	2	1100	42	90000	22.65	169900	3229087
Jaldapara WL	3	10	596464	174	157200	370	486200	329.67	696300	1936164
Buxa TR	3	16	620977	152	135630	466	1017320	1890.5	2590970	4502897
Kurseong	2	11	228782	59	62400	290	396900	330.2	2476500	3164582
Baikunthapur	5		276128	-	-	637	1049385	378.59	2840133	4165646
Coochbehar	-	-	-	-	-	-	-	628.75	20970	23670

CONCLUSION

It has been found with advanced and co ordinate conservation strategies the number of wild animals is increasing in protected areas of Terai and Dooars in past few years. However, with increase in number of wild animals, the occurrences of human–animal conflict has also gone up tremendously resulting in huge human casualties. It is noticed in most research reports, wildlife losses are mostly highlighted, ignoring human deaths and injuries. Human beings being the chief biological resource, hence, preservation of human life has to be given proper priority and importance. The study shows the amount of increasing anthropogenic losses with time. In addition to life losses, these conflicts produce a negative psychological effect among the locals encountering these routinely. This increases the chances of retaliatory effects among the locale. Hence, if this trend continues it will be a huge challenge to conserve wild life in nature.

Recommendations

Community based forest, wildlife and other resource management is also required for peaceful coexistence between human beings and nature of which wildlife is an inherent part.

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