

Exploring Human-Animal Conflict and Its Impact on Crop Damage

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Forests become the protective shelter hood to the wild animals and the wild animals are the backbone in protecting and preserving the biodiversity richness of the forests and both forest and wildlife has a mutualistic linkage and hence conservation and preservation of forests and wildlife becomes the mandate to the Department of Forests of any Government. Any lacunae in the conservation of one will lead to the destruction of the other. Richness of forest cover both in the plain and the hilly terrain enhances the microclimate and facilitate the living organisms and human life to coexist in a given environment. For that better understanding about the fauna and flora available in the forest to the mankind is a must and hence the human folk should be given a periodic awareness creation exercise about the conservational aspects of wild life besides facilitating Tourism in the forest floor to have a better understanding of the wild forms and the ill effects of faunal and floral depletion while performing tourism in the forest floor.

Forest Cover in India and Tamil Nadu

Documenting the forest cover across the nations and the gain in Indian Forest cover alone would not suffice for the wellbeing of the animals in the forests. The predatory nature of animals love to stay in the dense forest habitat and the herbivores love to roam in and around the moderate dense forest and the open forest environment. Moreover, their habitat is mainly depending on the food and waterhole availability in the forests. Accordingly, the animals used to select their living environs. In this respect, the availability of dense and moderately dense forest in India and the State of Tamil Nadu are documented for better understanding of the forests and the animals' habitat in the environment. The dense forest and moderately dense forest spread in India and Tamil Nadu are presented in Table 1.

Table 1 - Details of Dense and Moderately Dense Forest Cover in India and Tamil Nadu

Sl. No	Type of Forests	Forest Cover in India (Area in Sq. Km)	Forest Cover in Tamil Nadu (Area in Sq. Km)	Forest Cover in Coimbatore
01	Very Dense Forests	98158 (02.99)	3672 (02.82)	364 (07.69)
02	Moderately Dense Forests	308318 (09.38)	10979 (08.44)	669 (14.14)
03	Open Forests	301797 (09.18)	11630 (08.94)	942 (19.91)
	Total Forest Cover	708273 (21.54)	26281 (20.21)	1975 (41.74)
04	Scrub	45979 (01.40)	657 (00.50)	001 (00.02)
05	Non-Forest Areas	2533217 (77.06)	103122 (79.29)	2756 (58.24)
Total Geographical Area		3287469 (100.00)	130060 (100.00)	4732 (100.00)

(Figures in Parentheses indicate Percentage to Total Geographical Area)

(Source: Forest Survey of India, Ministry of Environment, Forest and Climate Change, 2017)

In India and Tamil Nadu, very dense forest covers approximately 3% and 2.82% respectively. However, Coimbatore Forest stands out with around 7.70% of very dense forest, providing habitat for predatory animals. Moderately dense forest constitutes 9.38% and 8.44% of the total area in India and Tamil Nadu respectively, whereas Coimbatore Forest boasts 14% of such forest type. Open forests, comprising 9% of India's total geographical area and 9% of Tamil Nadu's, account for approximately 20% of Coimbatore Forest. These open forests serve as grazing grounds for herbivores and habitat for many animals. Predatory animals primarily seek food in

moderately dense and open forests where herbivores are abundant, often venturing out from their habitats.

Wild animals seek habitats providing food, shelter, protection, and suitable mates for reproduction. Factors such as soil, moisture, temperature range, light intensity, and food availability influence habitat suitability. During winter, animals prefer warmer shelters, often seeking thick foliage or cave-like structures adjacent to rocks for protection.

Wildlife – Habitat Relationships

Wild animals require four essential habitat components: Food, Water, Forest Cover, and Living Space. Predatory animals, such as Tigers, mark their territory in the forest by urinating boundaries, deterring other animals from entering. The abundance and distribution of these components determine the types of wildlife that can thrive in the forest habitat.

Wildlife depend on forest cover for nesting, shelter, and protection from predators and harsh weather conditions. Different types of cover, like burrows, tree cavities, or brush piles, cater to their specific needs. The amount and types of cover available determine the species of wildlife present. Larger animals need larger home ranges, and undeveloped habitats are crucial for predatory wildlife.

Wildlife management involves often manipulating the components of the habitat to favour particular species or groups of species. It is not possible always to alter the amount of space given and water in a habitat. If water scarcity is available, artificial way of providing water to the wild animals through some tubs or through water tanks might solve the animal needs for water and food. The food shortage can also be managed by planting the fodder trees or crops in the habitat of herbivores so that the animal management becomes easy and they do not migrate to the crop lands for human living environment as invasion. On failing to provide the needs of wild animals, the animals used to migrate for food and water. In search of it, the way by which crop lands available means, they used to raid the lands and feed the crops.

Problem Focus

The Human wildlife conflict is on the increasing across the world due to many factors such as growth in the human population and increased consumption of natural resources from forest viz. fruits, fiber, fodder, floss, fuel and flesh (6Fs) as cheaper in cost and hence the common public are trying to take as much as possible from the forest in the absence of protection of forest in the human habitation. Another factor is establishment of animal loving crops in the forest fringes like Banana, Sugarcane etc. Habitat loss and fragmentation to the elephants and the unauthorized erection of buildings of religious nature and schools in the elephant corridors were forced the elephants to cross migrate to the human habitations.

Crop damage is a major problem in the farm lands adjacent to wildlife corridors. Bell (1984) reported that the crop damage is prevalent mostly in the boundary of the forest and it does not move into the distant locations for its food. Similar results were observed in the study conducted by Hawkes (1991). Because of the nearness of the human habitations which are closer to the forests, the predatory animals too started lifting the cattle and small ruminants grown in the farm lands which are found to be increasing in recent days because the animals can't escape when it tried to lift the animals and hence it freely approaches the habitations for food. In these circumstances, the study has aimed at addressing the background reasons for the human wildlife conflicts with the following defined objectives.

Details of Crop Damages Caused by the Wild Animals

While animal is performing migration, if the crop stands are good and attractive to the animals, immediately animals tried to feed and able to take away the food material grown in the farm especially sugarcane followed by Banana and Maize which are attractive food to the animals. While feeding the crops, the human being used to threaten the animals and they were trying to keep the animals away from the farm floor by making use of crackers and other whistle type arrangements in the farm floor. Due to such sudden threats, the animal used to migrate here and there and

cause much damages to the crops grown along the forest fringe villages. The year wise crop damages caused by the wild animals and the details of compensation paid are presented in Table 5.28.

Table 2: Crop Damages Caused by Wild Animals in Coimbatore Forest Division

Sl. No	Year	Details of Crop Damages		Compensation Paid Per Farm in Rs.
		Number of Crop Damages	Compensation Paid in Lakhs (INR)	
01	2011-12	389	41.41	10645.00
02	2012-13	212	21.67	10222.00
03	2013-14	135	16.51	12229.00
04	2014-15	571	92.32	16168.00
05	2015-16	521	56.05	10758.00
06	2016-17	266	35.88	13489.00
07	2017-18	315	20.81	6607.00
Total		2409	284.65	11816.00
Average Number of Damages per Annum		345	40.66	11786.00

(Source: DFO office documents 2018)

Table 2 revealed that in a seven-year period of time, a total of 2409 crop damage occurrence is visible in the forest floor of Coimbatore. For that the compensation paid is arrived at 284.65 lakhs. On an average, 345 crop damages were occurring per annum indicating that every day the crop damage is occurring in the forest fringe villages. One affected farm is able to receive the compensation of Rs. 11786 on an average irrespective of acreage. To mitigate such conflicts, the Farms adjacent to the forest floor should be restricted with growing animal loving crops or the farm boundary or the forest boundary may be provided with elephant proof trench to avoid such conflicts.

Another reason for crop damage in the forest fringe villages are non-availability of sufficient fodder species for herbivores like elephants. The Forest

Department should establish the elephant loving crops in the corridor passage and the water provision by erecting the water tanks in the corridors so that most of the animals will not violate. Studies revealed that the elephant food species available in the corridor is found to be very limited (WTI, 2017) and the natural streams in the corridor is also absolutely absent during the summer seasons and hence the role of Forest Department in erecting the water ponds both for drinking and bathing in the wild environment must be made to alleviate the problem of searching water in the farm side. In some of the farm floor, the elephant has damaged field for want of water and eatables and hence establishment of fodder plantation and water pond must be essential. However, it is important to identify the type of crop damaged in the farm floor and hence effort has been taken to analyse the details of crops damaged and the results are presented in Table 3.

Table 3: Details of Crop Damage Occurred in the Farm Households

Sl. No	Name of the Crops	Area in Ha	Area of Crop Damage	Percentage to Total Area
01	Banana	164.00	24.50	14.94
02	Sugarcane	30.00	03.00	10.00
03	Mango	06.00	01.00	16.67
04	Vegetables	11.00	01.50	13.64
05	Cereals	18.00	02.10	11.67
06	Pulses	14.00	00.50	03.57
07	Areca nut	71.00	02.30	03.24
08	Coconut	80.00	05.80	07.25
	Total	394.00	40.70	10.33

Table 3 revealed that the commercial crops are being cultivated in the forest fringe villages. The commercial crops cultivated are Banana, Sugarcane, Mango, Areca nut and Coconut. Higher damages to the crops visualized are Banana, Sugarcane, Coconut and Areca nut. Though the percentage is appearing different, higher area under crop damage could be observed in the four crops.

Details of Property Damages Caused by the Wild Animals in the Farm Floor

Property of the farm holdings were damaged by the wild animals while they visit to the farm for feeding and other requirements. The data availability

on property damages per annum is available but the type of property damaged are not available with the Forest Department. In this respect, the property damage caused by the animals over years have been analysed and the results are presented in Table 4.

Table 4: Property Damage Caused by Wild Animals in Coimbatore Forest Division

Sl. No	Year	Property Damage		Compensation Paid Per Damage in Rs.
		Number of Damages	Compensation Paid in Lakhs (INR)	
01	2011-12	22	01.30	6000.00
02	2012-13	02	02.75	137500.00
03	2013-14	04	00.19	4750.00
04	2014-15	68	03.72	5471.00
05	2015-16	36	01.63	4528.00
06	2016-17	45	03.81	8467.00
07	2017-18	39	01.63	4180.00
Total		216	15.03	6945.00
Average Number of Damages per Annum		31.00	02.14	6945.00

(Source: DFO office documents 2018)

Table 4 revealed that the property damaged over the seven years period was arrived at 216 in numbers with a mean damage of property per annum is 31. Over the years data revealed that 2014-15 has faced a large number of damages which is arrived at 68 incidents. It might be due to the scarcity of water and feed in the wild zone for the animals and hence it has migrated periodically to the farm holdings. Once the elephant has identified the potential source of the farm for water and feed and then it periodically tries to visit the farm and hence the owner of the farm should make an alternate arrangement in the forest fringes to provide its needs so that the violation could be kept at minimum.

The years 2012-13 and 2013-14 has witnessed a very minimum attacks on the property. It might be

due to the abundant rain, good green cover due to good rainfall. Because of these, the elephants search for water and food becomes less important and hence no damages other than two incidents of damages during 2012-13. But the compensation paid indicated that the higher amount of compensation to the farm holdings which is arrived at 1.37 lakhs per damage of property during the year 2012-13. It indicated that the damage of houses might have been occurred due to the attack of single stray elephant and attracted higher compensation. In all other years, the compensation paid per damage is varying from Rs. 4180 to Rs. 8467 based on the nature and type of damages.

To sum up, among the different forest divisions, the man-animal conflict was found to be maximum in respect of Coimbatore Forest Division and the Anamalai Tiger Reserve being the protected environment faced little conflicts and capable of paying compensation to different losses on a higher scale. It might be due to the higher allocation of funds under different compensation head with the Forest Department. Among the different losses because of the wild animals, the livestock damage is found to be very minimum in the Coimbatore Forest Division and the attack took place very rarely during the absence of required food and water to the wild animals.

Conclusion

The present study on Man-Animal Conflicts is one of the burning issues among the socio political and environmental arena where the environment is damaged by the human for want of food, fuel, fodder and small timber requirements and at the same time the animal invades to the adjacent crop fields for want of food and water. This type of invasion is existing all time among the man and the animals particularly among the elephants and very rarely the predatory animals.

In a seven-year period of time, a total of 2409 crop damage occurrence is visible in the forest floor of Coimbatore. For that the compensation paid is arrived at 284.65 lakhs. On an average, 345 crop damages were occurring per annum indicating that every day the crop damage is occurring in the forest fringe villages. One affected farm is able to receive the compensation of Rs. 11786 on an average irrespective of acreage.

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Around one livestock was attacked by the wild animals per annum. For that a compensation of Rs 10563 was paid per animal by the Forest Department. When one could examine the compensation paid over years for the livestock death, 2017-18 has witnessed a considerable hike in the compensation from around Rs 10000 to 18000 per animal based on the severity of the damage. However, during the year 2013-14 one could witness the payment of compensation of Rs 5000 per damage. It seems to be very low. The lower compensation might be due to less injuries and damage to animals without any hazard to the life of the animals.

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