



# REPORT ON HUMAN WILDLIFE CONFLICT, ITS CAUSES, EFFECTS AND CONTROL MEASURES IN KODAGU REGION OF KARNATAKA

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## Abstract

Since time immemorial animals have co-evolved with humans which until recent years proved to be a positive interaction, now has lead to a colliding one. Human animal conflict has a long historical existence, its increasing severity and complex nature has made it a central issue to wildlife management. In India, the animals that are involved in the crop damage, livestock attacks, human injuries, include elephants, bison, tigers, leopards, monkeys, and many others. In South India, most of the attacks are done by elephants, tigers and leopards. The compensation has been applied with aim of reducing economic burden following wildlife damage and improving people's tolerance towards wildlife. In this regard a case study was conducted to gather the data of five years (2018-2023) with respect to the causes, effects and implementation of preventive measures of HWC in Kodagu district.

**Key words:** Co-evolved, Elephants, Human animal conflict, Preventive measures, Wildlife.

## Introduction

Human animal conflict has been simply defined as occurring when the needs and the behaviour of wildlife impact are negative, when the goals of humans negatively impact the needs of the wildlife (IUCN 2005). The impact includes loss of livestock damage, damage of harvest, loss of human life, loss of physical property. Different methods have been adapted for managing the wildlife. This includes lethal methods, relocation, separation via barrier and fencing. Understanding the social context fir conflict between conservation and human welfare is central to biodiversity conservation. The severity of the problem is increasing because of number of factors such as increase in human population anthropogenic encroachment into wildlife habitats resulting in transformation of wildlife habitats into urban, suburban areas and agrarian ecosystem and fragmentation of wildlife habitat causing constriction of wildlife population into marginal habitat patches. Humans have a long complex relationship with wildlife animals varying between appreciation,

reverence, retaliation, utilization and acceptance. Human animal conflict has a long historical existence, its increasing severity and complex nature has made it a central issue to wildlife management. Conservation of wildlife in educating people on this is one of the by factor that feels hostility of people towards wildlife presentation. Human animal conflict in the developed work focuses on the nuisance active of wildlife that interfere with the lifestyle of the residents. The conflict should be managed in such a way that is publicly acceptable and does not interfere in wildlife conservation goals.

Human animal conflict occurs in a vast range of situations and is also specific in terms of habitat, geographical location, vegetation, and climate with a diverse population of species, spread of settlements has become a major reason for the restriction of wildlife into small, fragmented patches within the matrix of dominant landscape. Human animal conflict occurs when animal needs go beyond those of human beings, making local people and wild animals compete over resources. People today are witnessing the repercussions of human animal conflict. In India, the animals that are involved in the crop damage, livestock attacks, human injuries, include elephants, bisons, tigers, leopards, monkeys, and many others. In South India, most of the attacks are done by elephants, tigers and leopards. The compensation has been applied with aim of reducing economic burden following wildlife damage and improving people's tolerance towards wildlife.

In India elephant related conflict alone has been estimated to damage 0.8-1 million hectares of crops every year and 10,000-15,000 properties. Human injury and death have also been attributed to tigers in India. Critics find that compensation schemes are vulnerable to corruption or fraud, riddled with inefficiencies, lack transparency, subject effected people to long administrative delays, fail to account for transaction costs, and provide meagre support. The role of compensation in addressing human wildlife conflicts remains widely debated, lacks quantitative evidence, and requires further evaluations. Long term exposures to the rush of wildlife related injury or death can increase people towards wildlife and lead to retaliatory killing, particularly among rural communities living near protected areas. Post-independence, the government established protected areas and passed conversation laws such as the Wildlife Protection Act (1972) to guide Wildlife management and protect wildlife. Compensation payments in India originated to preserve large charismatic species like the tiger and elephant, which flagships for conservation efforts in the 1970s and 1990s, respectively. Managing human – Wildlife conflict is a significant conservation challenge especially with respect to endangered species and protected areas in India. Data limitations on the timing and locations of actual conflicts and lack of access to detail records of compensation restrict us to survey of local people as the primary source of information.

Laurie and Sivamani, (2009) analysed and studied the management of leopard –human conflict in India. They have the distribution, season, actions taken, government involvement, community involvement, scientific knowledge, comparing different state status, report. Sanjay *et al.* (2014) conducted studies on the conflict between largest Asian elephant and humans in parts of Karnataka. According to them, the communities living in the proximity to elephant's habitat are causing hindrance to the life of elephants. This has caused many deaths of both human and elephants. This has impacted the growth of physical barriers, conserving key habitat linkages, baseline data for future works. In order to effectively address human-elephant conflict and foster peaceful coexistence over the long term, management efforts must simultaneously concentrate on site-specific

factors and develop and implement strategic plans at the landscape level that directly address underlying anthropogenic drivers and their spatiotemporal variation. While enhancing conservation management planning, it is also important to take into account the spatial use of habitat to support household production and local livelihoods in addition to the demands of wildlife (Shaffer et al., 2019).

Krithi *et al.* (2012) collected the information of effectiveness of compensation payments in mitigating and resolving HWC they analysed the procedure, typed and payments made for incident reported in India from 2010 to 2015. The positive and negative aspects of human and wildlife interaction both within and outside the protected area and the varied priorities and approaches to conservation planning in either zone was studied by Meena (2016). Their work emphasized the need for all government to work synergistically to achieve common goals and optimize resources and planning. A case study was done about the HWC in India, to analyse its trends in the country on rapid spread of Human Wildlife conflict to a greater proposition of the country geographical area during the year 1995-2010 by Shaurabh and Sindhu (2017); Hill (2015); Senthilkumar and Mathialagan (2016). The study was conducted on biosocial perspective of animals for understanding human wildlife relationship.

Govind and Jayson (2021) worked on human-leopard conflict on the Kerala-Tamil Nadu border in Southern India. The leopard attack on humans and livestock was quantified during 2009-2012. They collected information on the conflict from the year 2009-2012. Inong and Mubita (2023) carried out a project to collect information about human wildlife conflict assessing the causes, consequences, and management strategies in Mosi-Oa-Tunya National Park Livingstone in Zambia. Assessment of HWC was done by explaining nature, causes, and mitigation measures of human wildlife conflict. The consequences, compensation scheme and management strategies to identify animals causing HWC was also determined in the study area. Bhatia *et al.* (2012) studied the role of representations of human-leopard conflict in Mumbai through media content analysis. They conducted a content analysis of print media articles on human- leopard conflict in Mumbai to understand the framing of HWC and the changes in media coverage over a 10-year period (2001-2011). The human Wildlife conflict has gradually spread to a greater proportion of the country's geographical area (Shaurabh and Sindhu, 2017). Kodagu being one of the richest forest cover in South India is also facing the threat of human animal conflict in the present decade. The cases of damage caused is steadily increasing day by day. In this perspective a study was carried out to document the causes, consequences of HWC and steps taken by the local authority to solve and overcome this severe problem in this area of central Western Ghats.

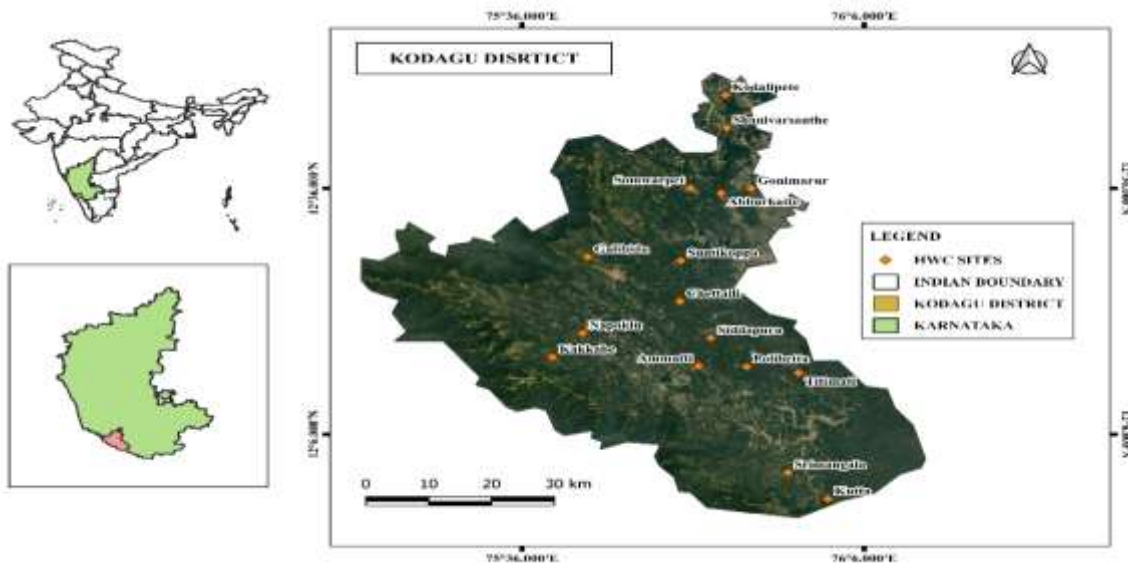
**Materials and methodology:****Study area:**

Fig. 1: Kodagu map showing the Human wildlife conflict (HWC) sites

Located on the eastern slopes of Western Ghats, Kodagu spans over 4102 sq. km and is blessed with 3251 sq. km of forest area (79.25 pc of total geographical area) out of which 796 sq. km is dense forest cover, as per the State of the Forest Report 2017 by the Ministry of Environment and Forest. Kodagu has undulating topography, interspersed with valleys cultivating largely coffee and plains with mostly paddy. There are other crops like cardamom, pepper, coconut, areca nut and most recently, even oil palms that are grown here. Kodagu is known for its coffee cultivation and coffee agroforestry practised here contributes to the biodiversity of the region. The largest coffee-producing district in the state, the latest estimate of the Coffee Board of India suggests, Kodagu contributes 34 percent to the coffee production in India. Kodagu is surrounded by thick forests. There are three wildlife sanctuaries—the Brahma Giri, the Pushpa Giri and the Tala Kaveri wildlife sanctuaries and one national park, Rajiv Gandhi national park, also called Nagar hole Tiger Reserve. All these contribute to making the Kodagu landscape resemble one unending forest despite severe fragmentation of forest at various spots. This seamlessness of forests and farmlands make the landscape conducive for gentle giants to move in and out of forests in search of food.

This study was conducted systematically in Kodagu district. Villages with more number of animal attacks and damages were visited. Information was gathered during the study period 2018-2023. Newspaper articles and information of recent attacks was collected from the villagers and forest department personnel from various regions of the district. Different places of attacks were visited randomly to collect information on HWC and its severity by doing household surveys as per Inong and Mubita, (2023). Major information like the number of attacks from past five years, number of human deaths, number of animals of the livestock damaged and dead, reason behind the increase in the wildlife attack, compensation given to the family that suffered, measures taken to control wildlife conflict, time taken for completion of the measures taken, changes in the compensation based on the severity of the damage were obtained from the officials of the Regional Forest Office at Madikeri and Virajpet division of the district.

## Result and discussion:

The field survey of local people revealed the extent of HWC as severe by 60%, moderately effective by 20%, not a problem by 3.75% and more than 15% people did not want to respond about this stating the problem can never be solved completely. Man-animal conflict, which is caused by human-wildlife competition for natural resources, has an impact on human food security and the well-being of both humans and animals. Apart from damage to crops, there is a constant fear of elephant and tiger attacks that the planters and workers live with. In intense conflict areas, there is a shortage of farmhands. Cases of labourers getting trampled on by enraged elephants have become very common in the district. In past five years about 8292 ha crop area is damaged more predominantly in Madikeri division.

Table 2: Response of villagers on how HWC at different conflict areas of the district.

Question: Extension of HWC problem	Response	Total n (%)
	Intense	48 (60%)
	Moderate	16 (20%)
	Not a problem	3 (3.75%)
	Do not know	1 (1.25%)
	No response	12 (15%)
Total (n=80)		80 (100)

The number of human deaths exceeds a dozen with more than 45 casualties. Some of the wild animals also have lost their lives at different regions of the district due to various reasons. The livestock killed by tiger attack in Virajpet division alone exceeds hundred. The forest department has spent more than 25 crores of rupees to compensate the victims and also to implement various mitigating and preventive measures of the conflict by using fencing method, trenches and so on (Table.1 and Table. 2). Elephants are migratory animals and are known to travel up to hundreds of kilometres. The migratory routes of the elephants are fixed and are used for generations. But now as agricultural lands are developing, they are overlapping the migratory routes of these animals resulting into the entry of the elephants in those agricultural lands. The number of these conflicts has increased in many regions in recent decades because of human habitat extension and land use change. Assessing the data, it is evident that the major animal species that is causing the most damage in Kodagu is elephants. There is also rapid increase in their number but there is also a rapid decrease in the forest they live in, initiating them to enter human habitat which was once their land.

Table.1: Consolidated data of damage caused by HWC and relief provided at Madikeri division of Kodagu (Source: Regional Forest Office, Madikeri, Kodagu).

YEAR	CROP DAMAGE (Ha)	EFFECT ON HUMANS/ANIMALS			COMPENSATION IN RUPEES	PREVENTIVE MEASURES IN Km		TOTAL EXPENSE
		INJURIES	DEATH	CATTLE DAMAGE	TOTAL	TRENCH	FENCE	
2018-19	1117	4	0	18	5648000.00	0	3.000	11002988.00
2019-20	1259	4	1	7	7549403.00	6.950	0	12185403.00
2020-21	1428	3	0	5	10220000.00	3.5	29.37	21352656.00
2021-22	1458	5	4	12	16969917.00	12.08	12.98	30212438.00
2022-23	1976	4	3	14	16509536.00	17.2	33.922	51878319.00
TOTAL	7238	20	8	56	56896856.00	39.734	79.272	126631804.0

Table.2: Consolidated data of damage caused by HWC and relief provided at Virajpet division of Kodagu (Source: Regional Forest Office, Madikeri, Kodagu).

YEAR	CROP DAMAGE (Ha)	EFFECT ON HUMANS/ANIMALS			COMPENSATION IN RUPEES	PREVENTIVE MEASURES IN Km		TOTAL EXPENSE
		INJURIES	DEATH	CATTLE DAMAGE	TOTAL	TRENCH	FENCE	
2018-19	1328	4	0	18	91,53,454.00	0	3	92,25,454.00
2019-20	1146	7	0	16	88,05,378.00	0	33.34	1,52,57,187.00
2020-21	1430	2	0	1	96,59,968.00	5.50	0.87	1,43,09,718.00
2021-22	2122	11	9	28	1,80,37,080.00	37.77	5	5,10,42,626.00
2022-23	1054	1	1	20	78,48,517.00	18.59	18	37,75,594.00
TOTAL	7080	25	10	83	5,35,04,397.00	61.86	90.21	12,75,90,949.00

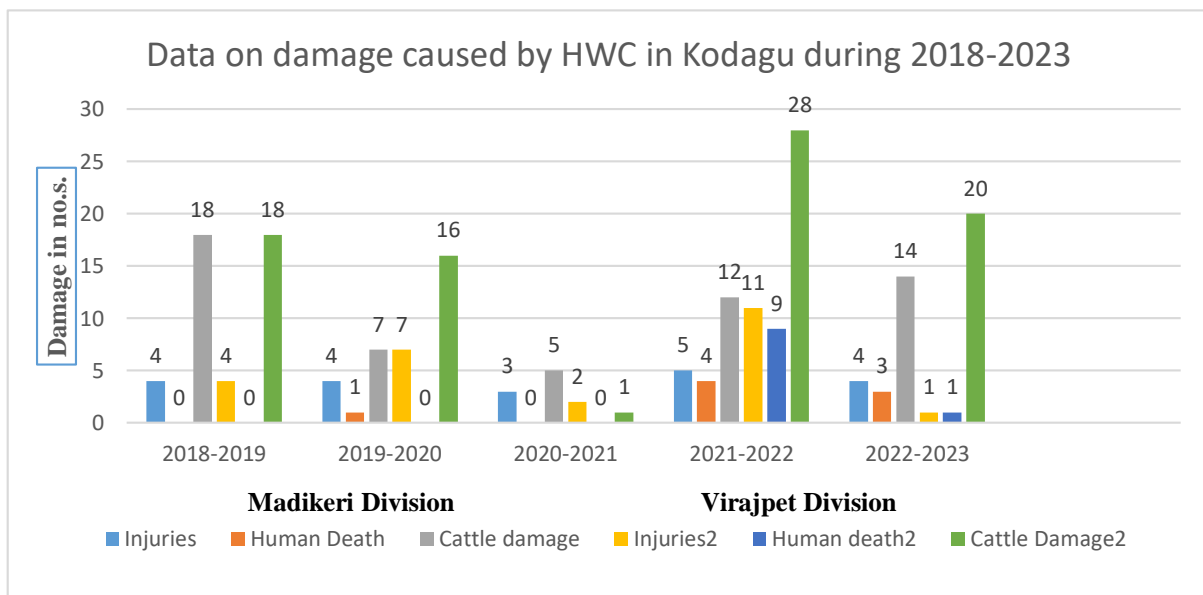


Fig. 1: Graph showing five years data damage caused by human wildlife conflict.

**Measures taken by Government and Forest Department to mitigate HWC:**

sing radio collars, the Forest Department is tracking the movement of elephants and other wild animals warning people when the animals approach human habitations. According to experts this is one of the many tools to win people trust and get their cooperation in preventing conflicts.

Strengthening and preserving of elephant corridors for their easy movement and maintaining the availability of forage and water. Planting fruit and foliage (bamboo etc.,) plants in the forests.

Use of Solar fences to avoid entry of the wild animal into human habitats.

Minimizing night traffic along their route.

Making use of application of electronic gadgets and social media to alert people and also to track and send back the animals to forest.

**Discussion:**

Man-animal conflict in nature is negative interactions between humans and wild animals that have negative consequences for both humans and their resources on the one hand, and wildlife and their habitats on the other. Elephant and Baboons were cited as the most notorious conflict animals by the majority of the respondents. This may suggest that respondents have challenges in controlling these animal species. This can therefore can be

assumed that large-bodied terrestrial mammal species are likely to traverse far beyond protected areas borders onto human inhabited lands in their quest to satisfy daily dietary requirements thus making them important contributors to HWC (Inong and Mubita, 2023). The glorified coexistence between man and wildlife in India, if switched to the conflict mode, certainly has something to do with the threshold level of tolerance of both man and the wild animals. The unprecedented loss of wild habitats has decreased the tolerance level of wild animals to man and his actions (Sinu and Nagarajan 2015). The importance about the necessity for appropriate planning and management of physical barriers is evident. As a wider conflict resolution strategy, there is a need to install these physical barriers based on ecological boundaries of elephants rather than administrative division boundaries. For instance in the districts of Kodagu and Hassan, elephant populations are distributed even into reserved forests that are not part of any protected areas (Senthilkumar and Mathialagan, 2016). An increase in human population, resulting in encroachment of the habitats of wildlife and unscientific planning of our land for developmental activities are obvious reasons for the conflict, and we should try to regain the coexistence between man and wildlife. As their natural habitats are shrinking measures have to be taken to improvise the habitat and niche of those animals to help them lead a sustainable and peaceful life in a configured environment. While enhancing conservation management planning, it is also important to take into account the spatial use of habitat to support household production and local livelihoods in addition to the demands of wildlife (Shaffer et al., 2019).

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