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Human Wildlife Conflict: A Case Study in Kerala, India, India

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ABSTRACT

Human-wildlife conflicts have occurred throughout man's prehistory and recorded history. This conflict occurs with various negative results such as loss of both human and wildlife, loss of crops, damage and destruction of habitat etc. This loss affects similarly both humans as well as wild life. Therefore, it is important to manage the situation with fewer casualties which could be possible with proper awareness and communication. The present paper concentrates on a case study about human-wildlife conflicts conducted at Kerala.

INTRODUCTION

The interaction between wild animals and people and the resultant negative impact on people or their resources, or wild animals or their habitat is Called Human Wildlife Conflict. It occurs when growing human populations overlap with established wildlife territory, creating reduction of resources or life to some people and/ or wild animals. The conflict takes many forms ranging from loss of life or injury to humans, and animals both wild and domesticated, to competition for scarce resources to loss and degradation of habitat. Human-wildlife conflict is defined by the World Wide Fund for Nature (WWF) 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.

Human-wildlife conflicts have occurred throughout man's prehistory and recorded history. Amongst the early forms of human-wildlife conflict is the predation of the ancestors of prehistoric man by a number of predators of the Miocene such as saber-toothed cats, leopards, spotted hyenas amongst others. Fossil remains of early hominids show evidence of predation; the Taung Child, the fossilised skull of a young *Australopithecus africanus*, is thought to have been killed by an eagle from the distinct marks on its skull and the fossil having been found amongst egg shells and remains of small animals. The advent of farming and animal husbandry of the Neolithic Revolution increased the scope of conflict between humans and animals. The crops and the produce formed an abundant and easily obtained food source for wild animals. Wild herbivores competed with domesticated ones for pasture. In addition, they were a source for diseases which affected livestock. The livestock attracted predators which found them an easy source to prey on. The inevitable human reaction was to eliminate such threats to agriculture and domesticated animals. In addition, land was converted to agricultural and other uses and forests cleared, all of which impacted wild animals adversely. A number of animal species were eliminated locally or from

parts of their natural range. The deliberate or accidental introduction of animals in isolated island animal communities has caused extinction of a large number of species.

As human populations expand into wild animal habitats, natural wildlife territory is displaced. Reduction in the availability of natural prey/food sources leads to wild animals seeking alternate sources. Alternately, new resources created by humans draw wildlife resulting in conflict. The population density of wildlife and humans increase with overlaps in geographical areas used increasing their interaction thus resulting in increased physical conflict. Byproducts of human existence offer un-natural opportunity for wildlife in the form of food and sheltered interference and potentially destructive threat for both man and animals. Competition for food resources also occurs when humans attempt to harvest natural resources such as fish and grassland pasture.

OUTCOMES OF CONFLICT

Human-wildlife conflict occurs with various negative results (Figure 1). The major outcomes of human-wildlife conflict are:

- Injury and loss of life of humans and wildlife.
- Crop damage, livestock depredation, predation of managed wildlife stock.
- Damage to human property.
- Destruction of habitat.
- Collapse of wildlife populations and reduction of geographic ranges.

The above scenario says that Human-Wildlife conflicts are very common throughout the world in general and in India particular. Kerala is also not untouched with Human-Wildlife conflict. It is a state on India's tropical Malabar Coast, has nearly 600 km of Arabian Sea shoreline. It's known for its palm-lined beaches and its backwaters, a network of canals popular for cruises. Inland are the Western Ghats, a mountain range whose slopes support tea, coffee and spice plantations as well as abundant native wildlife. The forest area under the administrative charge of forest department is 11309.475 Km² and forms 29.1 % of the total geographical area of Kerala state (38863 Km²). Human population is increasing and natural habitats are shrinking. Therefore Human-Wildlife conflicts are bound to occur. There are seven major Human wildlife conflicts are observed in Kerala (Figure 2). These are:

1. Human-Leopard conflict
2. Human-Tiger conflict
3. Human- Elephant conflict
4. Human-Wild boar conflict
5. Human-Monkey conflict
6. Human – Sloth Beer conflict
7. Human-Snakes conflict

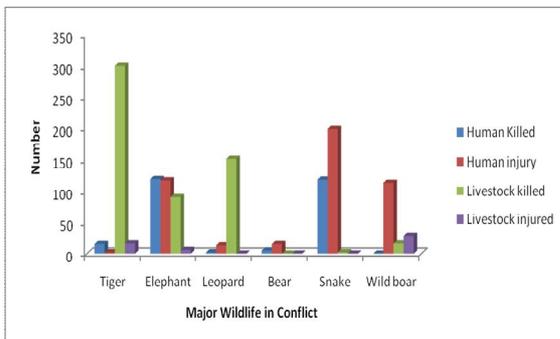


Figure 1: Human- Wildlife Interface (2002-2012)

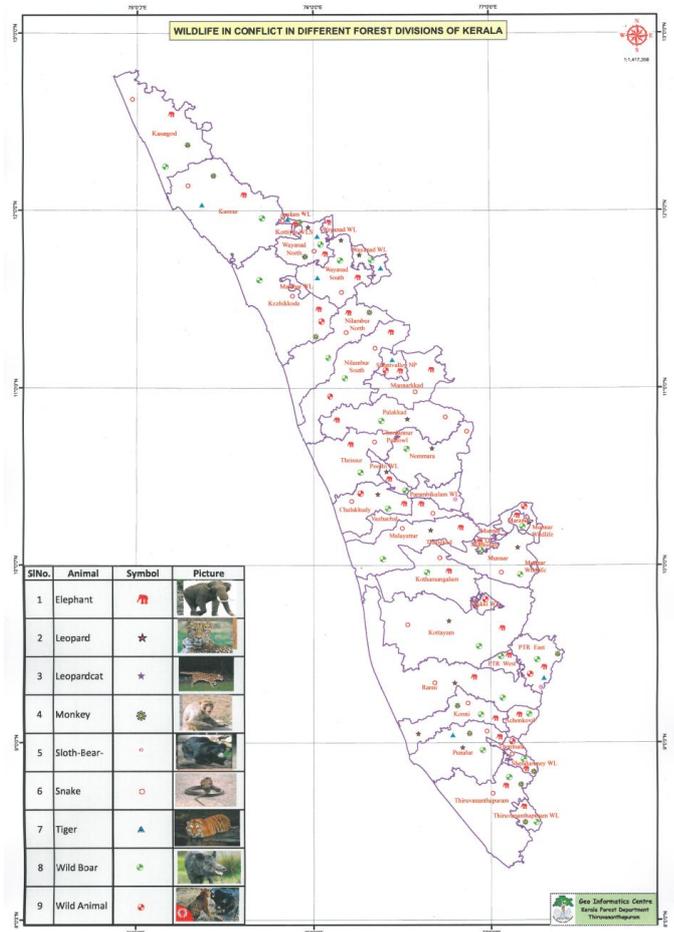


Figure 2: Map of major animals in conflict in Kerala

Human-Leopard Conflict

Leopard (*Panthera pardus*) is one of the five "big cats" in the genus *Panthera*. It is a member of the family Felidae with a wide range in sub-Saharan Africa and parts of Asia. Compared to other members of Felidae, the leopard has relatively short legs and a long body with a large skull. It is listed as vulnerable on the IUCN Red List because leopard populations are declining in large parts of their ranges. They

are threatened by habitat loss and pest control. Their habitats are fragmented and they are illegally hunted so that their pelts may be sold in wildlife trade for medicinal practices and decoration. In Kerala, It is rich in population but the habitat is going to degrade and preys of this predator are going to decline in an alarming rate. Hence, they start to come near the human population for the food as cattle. This phenomenon is bringing the event of Human-leopard conflicts in Kerala.

Management strategies for the Human-Leopard Conflict

Conflict management strategies earlier comprised lethal control, translocation, and conservation of endangered species like leopard. Recent management approaches attempt to use scientific research for better management outcomes, such as behaviour modification and reducing interaction. Human-Leopard conflict occurs when the needs and behaviour of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of Leopard." The following management strategies are required:

1. Population of prey of this predator should be maintained.
2. Scientific surveys are required to know the reasons of entering to the human population.
3. Appropriate fencing is required to check the leopard in villages' area near to its habitat.

4. Deforestation should be minimised or stopped and mitigation measures should be taken immediately.

Human-Tiger Conflict

Tiger is cited as endangered species by the IUCN (Figure 3). This cryptic carnivore occupies only the best habitat with highest quality of cover, water, prey, peace and mate, i.e inviolate space. Tiger presence signifies a rich and vibrant forest. It is the best indicator of a thriving ecosystem and rich biodiversity- grass, herbs, climbers, abundant prey base and presence of water. That is why tiger conservation can be safely equated with "Water Conservation" which is the crying need of the hour and is essential for the survival of the human race. Tigers occupy an area of 34,100 Km² in the WGs. Karnataka, Tamil Nadu and Kerala are the three main States harbouring tiger

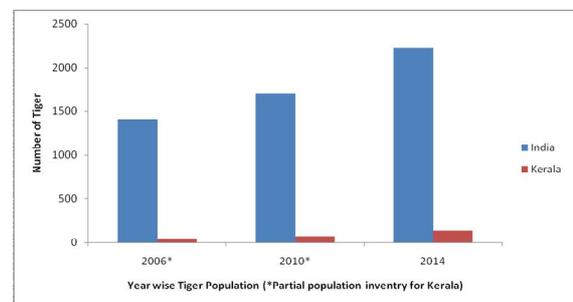


Figure 3: Tiger population in Kerala is depicted as per NTCA report

The WGs complex consists of three landscape units. The Periyar - Agasthyamalai landscape is one of the three important landscapes, which supports one of the largest tiger populations in the country. These areas are

also the prime location of ecotourism & mass tourism in Kerala. The local habitats are also rich near the tiger zones in the state. These two are the key factors of Human-Tiger conflict in general in Kerala state and Wyanard incident in particular.

Management strategies for the Human-Tiger Conflict

The appropriate management strategies for Human-Tiger conflict is lacking in the country as well as in Kerala state. Need for situation based scientific management strategies are required throughout the Tiger zone in the country. The following preliminary mitigation measures should be taken immediately to check the Human-tiger conflict for the conservation of this endangered species:

1. Scientifically screen the evidences of cattle lifting by Tiger and analyse the reasons for its movement into human habitation.
2. Appropriate site based Tiger proof fencing, sufficient lighting around the cattle sheds, clearing under growths around vegetation and creating awareness among the locals.
3. To encourage stall feeding amongst the cattle owners and avoid cattle movement into the tiger zones.
4. In case of attack on Human, a strictly adhering to NTCA guidelines of Tiger capture and release to the areas of abundant prey base, if the tiger is

healthy and removal of tiger from the wild as per the NTCA guidelines for man-eaters (F. No. 15-13/2007-NTCA).

3. Human-Elephant Conflict

Elephants are large mammals of the family Elephantidae and the order Proboscidea. Two species are traditionally recognised, the African elephant (*Loxodonta africana*) and the Asian elephant (*Elephas maximus*). All elephants have several distinctive features, the most notable of which is a long trunk or proboscis, used for many purposes, particularly breathing, lifting water and grasping objects. Their incisors grow into tusks, which can serve as weapons and as tools for moving objects and digging. Elephants' large ear flaps help to control their body temperature. Their pillar-like legs can carry their great weight. Elephants are herbivorous and can be found in different habitats including savannahs, forests, deserts and marshes. They prefer to stay near water. They are considered to be keystone species due to their impact on their environments. Other animals tend to keep their distance where predators such as lions, tigers, hyenas, and wild dogs usually target only the young elephants (or "calves"). India is rich with Asian elephant and Kerala is one of the states having richest population of Asian elephant. It comes under endangered species as per the IUCN. One of the biggest threats to elephant populations is the ivory trade, as the animals are poached for their ivory tusks. Other threats to wild Asian elephants

include habitat destruction. As Asian elephants are herbivorous and require a rich forest for their survival, the deforestation forcing them to enter the human population for searching adequate amount of food which has been creating the Human-Elephant conflict. In the present scenario, it is observed that the conflict is increasing day-by-day in Kerala.

Management strategies for the Human-Elephant Conflict

Elephant is one of the most important domestic wild animals in Kerala both culturally and socially. The wild elephants have been started to enter the human habitat for the paddy and other foods due to degradation and diversion of the habitat and obstruction of Elephant corridors. Such events are creating a strong conflict with human. Therefore, needful mitigation measures are needed. The preliminary steps should be taken are followings:

1. The solar power fencing of 707 Km, 494 Km of elephant proof trench, 24 Km of elephant proof wall has not prevented the elephant from causing damage to 118 human beings 120 human deaths in Kerala between 2002 to 2012. The recent Wyarnad incident has also created stir in the whole state. Therefore, a sound scientific management strategies are require to check the Human-Elephant conflict in Kerala.

2. KFD to have a trained group of forest personal as rapid response force (RRF) to ensure immediate action in places of Human-Elephant conflict.
3. Chasing away problem elephant from the place of crop raiding by using traditional methods like burning chillies, use of honey bees and replants involving local people.
4. Create awareness among the local communities to develop tolerance towards elephants as they are an integral part of social, cultural and traditional being.
5. In case of intensive problem use of konkies to capture and translocate and scientifically manage the problem elephants.

Human-Wild boar Conflict

The Indian boar (*Sus scrofa cristatus*), also known as the Andamanese pig or Moupin pig is a subspecies of wild boar native to India, Nepal, Burma, western Thailand and Sri Lanka. The Indian boar differs from its European counterpart by its larger, more sharply featured and straighter skull, its smaller, sharper ears and overall lighter build. It is taller and more sparsely haired than the European form, though its back bristles are much more developed. The tail is also more tufted, and the cheeks hairier. Adults measure from 83.82 to 91.44 cm (33.00 to 36.00 in) in shoulder height (with one specimen in Bengal

having reached 38 inches) and five feet in body length. Weight ranges from 90.72 to 136.08 kg (200.0 to 300.0 lb). The animal has interacted with humans in India since at least the Upper Paleolithic, with the oldest depiction being a cave painting in Bhimbetaka, and it occasionally appears in Vedic mythology. A story present in the Brāhmaṇas has Indra slaying an avaricious boar, who has stolen the treasure of the asuras, then giving its carcass to Vishnu, who offers it as a sacrifice to the gods. In the story's retelling in the Charaka Samhita, the boar is described as a form of Prajapati, and is credited with having raised the earth from the primeval waters. In the Ramayana and the Purans, the same boar is portrayed as an avatar of Vishnu. In the state of Kerala, it is a common mammals throughout the forest areas. It is very important species for the ecological balance because it comes under the most preferred prey of Tigers and their co-predators. It is herbivorous and prefers to eat tuberous plants and crops. Due to habitat loss, they use to come to the agricultural fields near by the forest. Such events create a sound conflict situation with human.

Management strategies for the Human-Wild boar Conflict

The following preliminary mitigation measures should be done:

1. Spraying of repellents / dung solution which will prevent the wild boar from the agricultural fields.

2. Using the clored cloths for fencing the conflict area.
3. Burning dung cakes
4. Planting thorny bushes around the area.

Human- Monkey Conflict

Monkeys are the common mammals in Kerala. They are very much associated with the people of the state. The rich population of monkeys sometimes creates the conflicting situation. They destroy the cultivated food & fruits crops, tease human beings by various activities and at times cause harm to the tourists and pilgrims visiting the state. The most common Monkeys found in Kerala are Rhesus Macaque, Bonnet Macaque, Nilgiri Langur and Hanuman Langur.

Management strategies for the Human-Monkeys Conflict

The following preliminary mitigation measures should be taken:

1. Feeding of Monkeys by the tourists & pilgrims to be avoided.
2. Chasing away conflicting monkeys by using traditional methods like drum beatings, use of crackers etc.
3. Use of trained monkeys and monkey catchers the conflicting ones.
4. Capturing and realising conflicting monkeys to distant areas.
5. Proper way of waste management will decrease monkey menace. Closed type

garbage boxes which monkeys won't open, should be used.

6. Initiate conservation education and awareness programs in schools, colleges and among the public.

Human-Sloth Bear conflict

The sloth bear (*Melursus ursinus*), also known as the labiated bear, is a nocturnal insectivorous bear species found wild within the Indian subcontinent. The sloth bear evolved from ancestral brown bears during the Pleistocene and shares features found in insect-eating mammals through convergent evolution. Unlike brown and black bears, sloth bears have lankier builds, long, shaggy coats that form a mane around the face, long, sickle-shaped claws, and a specially adapted lower lip and palate used for sucking insects. Sloth bears breed during spring and early summer and give birth near the beginning of winter. They feed on termites, honeybee colonies, and fruits. Sloth bear population is found throughout the country. In Kerala is also found in most of the forest patches. The habitats are shrinking due to many biotic and abiotic factors. Therefore, Sloth bears sometimes attack humans who encroach on their territories. Historically, humans have drastically reduced their habitat and diminished their population by hunting them for food and products such as their bacula and claws. These bears have been used as performing pets due to their tameable nature. The species is listed as vulnerable by the IUCN. Therefore,

conservation of this species is of utmost importance.

Management strategies for the Human-Sloth bear Conflict

The food habits of sloth bear such as fruits of *Ziziphus*, species, *Cassia fistula*, *Ficus* species etc are also the NTFPs of the state. Therefore, NTFPs collection was observed as a common phenomenon in Human-sloth Bear conflict along with other factors. The following mitigation measures are required:

1. Identification of Sloth bear habitats and restricting the NTFP collectors to enter the identified sites.
2. Grazing livestock should be ban near the sloth bear habitats.
3. It is also found that majority of bear attack were surprise attack, in which bear and/or human is not aware about the presence of each other. Such circumstances can be reduced by restricting human use and entries in escarpments and hillocks where bears are littering and resting.
4. Mapping of the Sloth bear habitats and awareness creations should be done by the KFD time-to-time in the areas of Sloth bear habitats involving local communities.

Human- Snakes Conflict

The snakes versus humans conflict is possibly one of the largest examples of Human-

Wildlife conflict in India today, but it is also largely ignored. The largest number of deaths due to animals in India is caused by snakebites. A study of snakebite mortality in India published in 2011 found that close to 46,000 people die of snakebite every year, far higher than the official estimates from government hospitals of between 1,300 and 1,400 deaths annually. The report said: "Thus, snakebite remains an underestimated cause of accidental death in modern India, causing about one death for every two HIV-related deaths." Same situations prevail in Kerala too. The most common snakes found in Kerala are Indian Cobra, King Cobra, Bamboo Pit Viper, Malabar Pit Viper, Russel Viper etc.

Management strategies for the Human-Snakes Conflict

The followings preliminary mitigation measures should be done:

1. Create awareness and educate to the local for the identification of venomous snakes and about the first aid in case of snake bites.
2. Snake helpline should be created by the KFD by training forest personal in handling snakes and also in First Aid measures.
3. Rescue team should be created by the KFD and a toll free number is widely distributed among the people.

4. Coordination with NGOs and NGIs, who work on the rescue and conflict mitigation regarding snakes should be done by the KFD and division wise list of such organizations / individuals should be uploaded in the KFD websites.
5. Snake rescue canters to be created by the KFD as well as snake rescue centers across the state if any to be collaborated with to ensure post capture release.

RECOMMENDATION

In general, awareness about habits and habitats of wildlife, ways to prevent and mitigate conflicts and need for tolerance to wildlife which is ingrained in our social and cultural life to be propagated among the local communities. While short term measures include constructing barriers like bio fencing, solar fencing, elephant proof trench, sterilizing animals, establishing rehabilitation centers, encouraging group farming, constituting anti-depredation squads, gathering intelligence about elephant movement and ensuring waste disposal by local bodies, long term mitigation measures may include acquiring corridors, relocating and rehabilitating conflicts animals to near natural habitats, monitoring of problem animals and reducing commercial activities in forest along with alternative fuel plantation and stall feeding of cattle. A centralized call centre (24 X7) in the Forest Head quarters needs to be setup to coordinate, gather and disseminate information regarding Human-Wildlife conflict.

An exclusive scientific research team to study the cause and effect of Human-Wildlife conflicts and the impact of mitigation measures needs to be engaged.

CONCLUSION

Major wildlife causing conflicts are Elephant, wild boar, monkey and snakes. There are no identified man eating Tiger in Kerala nor are there known rogue elephant. However, in the past, there have been incidences where tiger and leopard straying into human habitation are not sheared nor are there well structured protocols for mitigation of Human-Wildlife conflicts. The main reasons for Human-Wildlife conflicts are fragmentation of habitats, dispersed human hamlets across forest, high density of people in the forest fringes, change of land use pattern in the proximity of forest along with life style changes of farmers, increased waste accumulation, dependency on forest for collection of NTFPs and seasonal migration of animals (elephants from Mudumalai and Bandipur into Kerala).

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