

COMPREHENSIVE UNDERSTANDING AND METHODOLOGIES FOR THE MITIGATION OF HUMAN- WILDLIFE CONFLICT WITHIN THE ECOLOGICAL CONTEXT OF SIKKIM HIMALAYAS

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ABSTRACT

This article sheds light on the escalating issue of Human-Wildlife Conflict in the state of Sikkim, India. With approximately 65 percent of the population dependent on agriculture, this conflict has generated widespread chaos and threatens the foundation of Sikkim's renowned organic farming practices, which have gained global recognition. The conflict arises from the increase of encroachment of wildlife into agricultural lands, leading to significant crop destruction and economic hardships for local farmers. As a consequence, affected communities are compelled to seek alternative sources of income which disrupts the traditional agrarian way of life.

This paper aims to comprehensively analyze the problems and underlying causes contributing to the human-wildlife conflict in Sikkim. The article proposes the importance of awareness campaigns, education, and governmental policies will also be highlighted to create a harmonious balance between human needs and wildlife conservation.

By presenting a thorough examination of the human-Wildlife conflict in Sikkim and offering actionable recommendations, this article seeks to raise awareness that only through collaborative efforts and proactive measures will Sikkim be able to hold onto its unique organic farming heritage without compromising the conservation of the wildlife resources.

Keywords: Human-Wildlife Conflict, HWC, Livestock Predation, Crop Destruction, Mitigation

Introduction

Earth is home to different species .All species co exists maintaining a balanced ecosystem. However in the last few years certain human activities have caused disturbance in this balance. Deforestation is one of the factors that has left them with no shelter and food due to which wild animals venture into the human inhabited areas causing conflict and chaos. As human population expands and encroach upon their natural habitats conflict with wild animals become very frequent and this competition is because both compete for resources like food shelter and water. Human Wildlife Conflict are usually defined as negative interaction between human beings and Wildlife. Human wildlife conflict arises when the actions and requirements of wildlife have adverse affect on human beings or when humans interfere with the needs of wildlife. Such conflicts can arise

when wildlife pose harm to crops ,pose threats or harm people and domestic animals (Mekonen, 2020; Zubiri & Switzer 2001).

The rise in the seriousness of human-wildlife conflicts (HWC) has been linked to various causes, including the encroachment of human activities into natural habitats, the resurgence and spread of certain wildlife populations, and significant environmental alterations. These interactions have consistently posed risks to the species involved (Treves, 2009). Incidents of conflict between humans and wildlife are prevalent but are not uniformly spread due to their reliance on the closeness of wildlife. Moreover, various species inflict varying forms of harm during different seasons. The resulting damage has fluctuating impacts on households' livelihoods, contingent on their level of livelihood security during the incident (Mackonen , 2020) .It's a very big problem for the people who are fully dependent on sown crops as a means to livelihood (Chandra, 2023). This results in anger and fear amongst villagers for these wild animals who come to their habitat only in search of food .But the consequences of the wild entering human spaces caused greater losses so the people resort to various ways to combat the attacks like poisoning, using arms, scaring, crackers and sometimes they even set forests on fire (Madhusudan & Mishra, 2011). As human Beings are increasing in number so are developmental activities by them as a result human animal conflict are now common in urban and sub-urban areas as well (Soulsbury & White, 2015 ; Radha Krishna and Anand , 2017).

This increase of human animal conflict in recent years calls for a better understanding of this issue with all its complexities and hence use a sensible, scientific and compassionate approach to resolve this conflict.(Udgata,2011). It becomes very important to understand and recognize the issue in order to mitigate the conflict that ensures the well being of both humans and wildlife. Government initiatives like compensation also play an important role in lessening the resentment of the villagers towards the wildlife (Muolanga et al, 2003). This paper analyzes the problems and the reasons for these issues of frequent conflict in Sikkim. By understanding the problems and suggesting ways to mitigate the conflict this paper aims that harmonious co-existence between human and wild animals.

Method and Methodology

Study Area

Sikkim a Himalayan state has wide ranges of wild animals from red panda/Bharal/snow leopard/small cat species and black bear. There have been many reports of wild animals venturing into the areas inhabited by human beings. While some of the interactions may not be so dangerous like monkey entering building premises, stealing food etc there are other interactions that can cause and pose grave danger to human lives like black bears, small cat species etc.

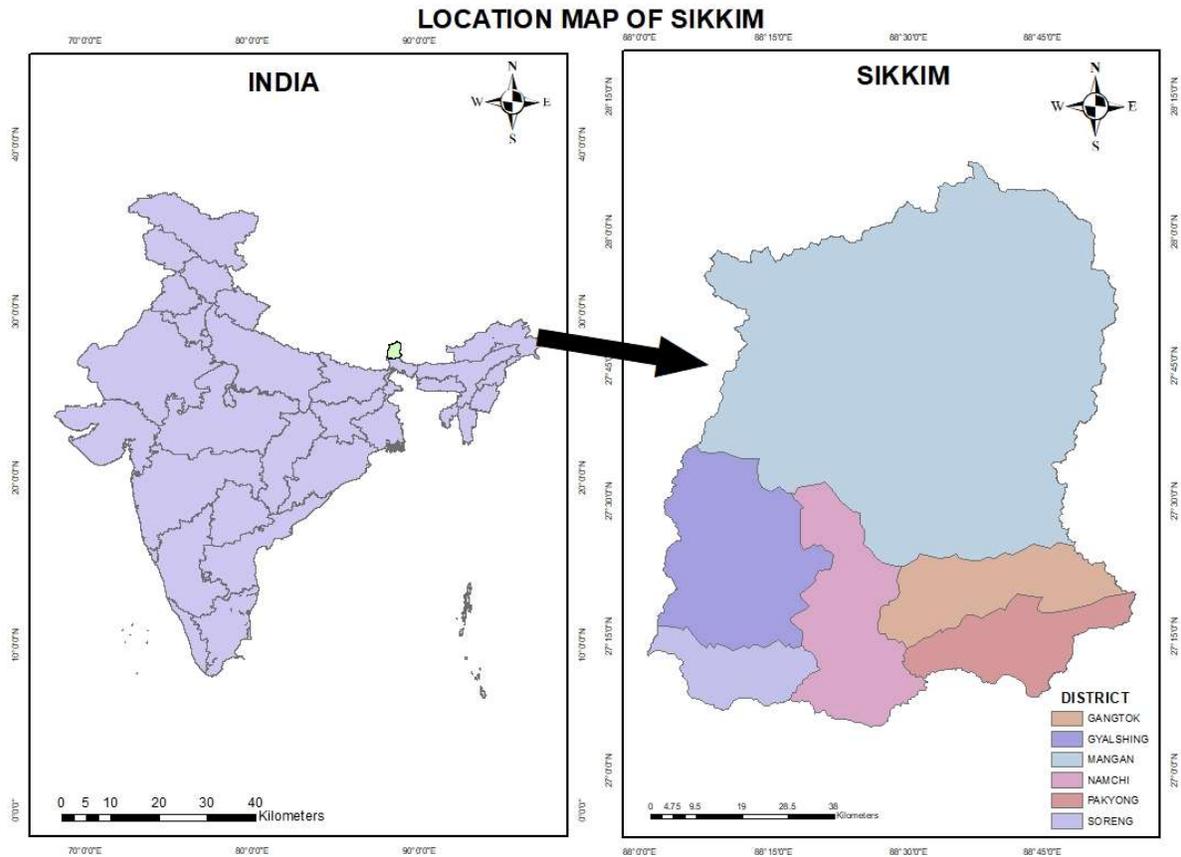


Figure 1. Showing location map of Sikkim.

Methodology

Secondary information was collected from local newspapers like Voice of Sikkim/Sikkim Chronicle /Summit Times etc. Primary data was collected from household survey and interviews. They were questioned varied questions ranging from Wildlife attack on human beings ,crop destruction ,livestock predation, destruction of property and the strategies they have used so far to avoid the conflict. The study was based on different villages of Sikkim from all the six districts ; Gangtok, Namchi, Soreng, Pakyong, Gyalshing and Mangan. The households that were interviewed lived in close proximity to forests and hence they derived large benefits from the forests which increased their visits to forests on regular intervals and hence making them vulnerable to human-wildlife conflict. The interview with the villagers helped provide in depth information about local views on human wildlife conflict and how much negatively its viewed by them and their own way to combat the conflict and if they believe in coexisting with the wild.

Human Wildlife Conflict: Sikkim

Human Wildlife attack can take place on different levels. There are various wildlife that venture into the human occupied areas. Most commonly found wild animals are Monkeys, wild cat species and most commonly Himalayan black bear. The study conducted has shown that the most common consequences of these attacks are crop destruction and livestock predation.

Type of Conflict	Number of households
Attack on human attack	20
Crop Destruction	160
livestock predation	100
property destruction	8

Table 1. Table showing type of conflict.

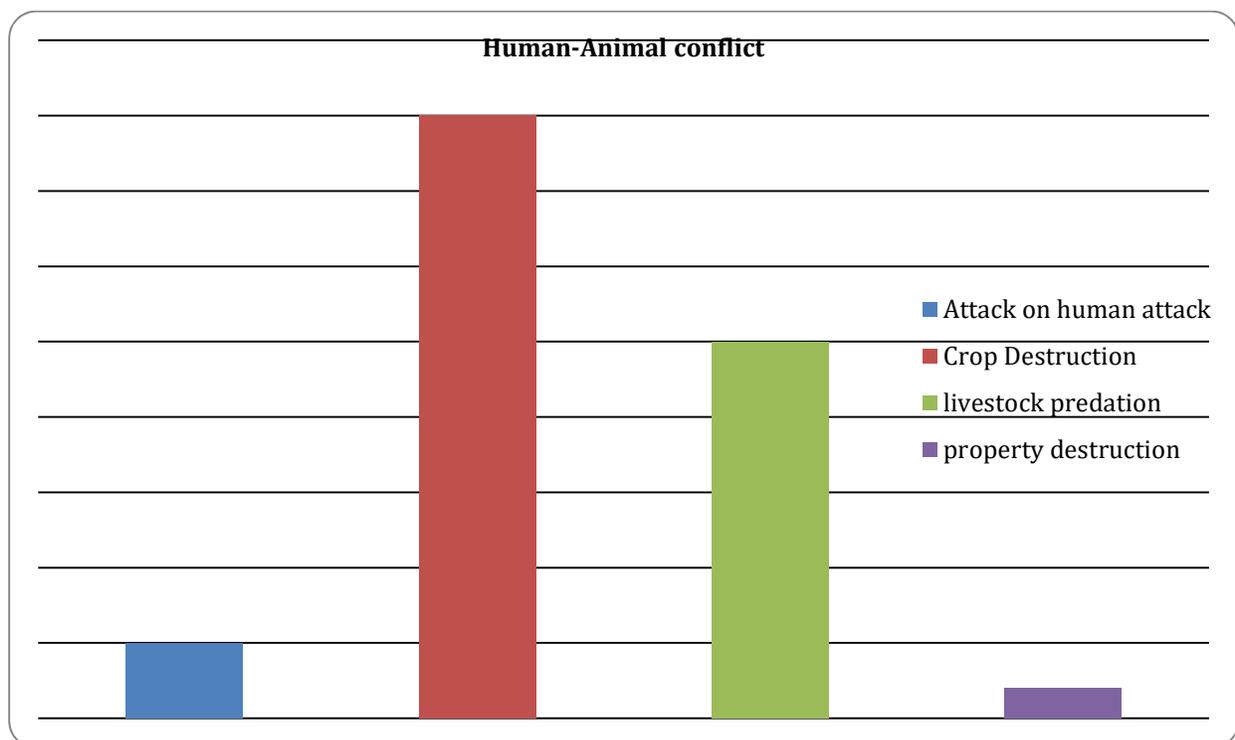


Figure 2. A graph showing destruction caused by human-Wildlife conflict(Source: Field survey 2022-23).

Crop Destruction/ Crop Raiding

According to the study conducted in the rural areas of Sikkim/ monkeys/porcupine/wild boar/leopard /barking deer/wild hare/Assam Macaque are the most common wild animals that are responsible for crop destruction. Hindustan Times article on 2018 has brought out the plight of farmers in Sikkim and how the wildlife attacks on their crops has led them to switch to an alternate source of income. The villagers after having tried various methods to ward off the wild animals by using scare crow and lighting fire to scare them off and villagers are fed up. Every year the farmers lose majority of their crops to wild animal attacks and thus have resorted to changing the source of livelihood. 65% of Sikkim's population is dependent on farming so such attacks of wild animals will cause heavy burden to the farmers dependent on agriculture as its their only source of livelihood. Sikkim's organic mission which started out on 2016 had been very successful and has given Sikkim in global level in organic farming. These attacks leading to searching for alternate source of income can also threaten Sikkim/s organic mission.

Livestock Predation

Most of the times when wild animals enter villages they do it in search of food hence they steal the domesticated animals. Many villages complained about cat species especially leopard responsible for killing of their goats and cows/their pet dogs and cats. In Timburbong village which is located in the west part of the state a leopard was responsible for killing of 21 goats/ six cows and calves and so many pet animals within the span of just two months of april and may this year. Also in West Sikkim in between the months of November and December there was increased bear attacks on livestock in the rural areas. In Sardung Lumjik Village a total of nine cattle were killed by the bear. Most of the people inhabiting the area have suffered livestock losses to bear attacks. The attacks aren't just limited to the darkness of the night but also occurs during daytime.



Fig 3. Bongten village in West Sikkim where bear destroyed corn fields of many farmers. Image Source: Voice of Sikkim.



Fig 4. Attack of wild bear on livestock. Source : Local Media house

Attack on Human beings

In the year 2022 there has been so many reports of Himalayan black bear venturing in the human inhabited areas especially from the month of November to march. They were captured in the cctv of urban areas of capital/Gangtok. In a village in West Sikkim called Bermoik a bear attacked rendered a local in a very serious condition and was hospitalized. In another incident around the month of October a lady while fetching firewood was brutally attacked. On April 2023 in North Sikkim / Mangan a local was attacked by a black bear. His face was attacked. When conducting field survey the villagers mentioned the constant fear of potential bear attack worries them especially when they have work in the forest like collecting vegetables and firewood. On one such study the villagers mentioned about the bear sighting near primary school hence the children going to school have constant fear of bear attack.

One of the causes of property destruction done by wild animals is expansion of human habitat and agricultural land.. Framers find their crops raided by wild animals who search for sustenance. The economic implications of property destruction in human Wildlife conflict are substantial. The

victims may face financial losses due to damaged property/crop failure/or loss of livestock. Also to mention the mental anxiety that the affected communities as they live in constant fear. The households which were surveyed feared the winter months the most because of bear sightings everywhere.

Causes

Improper waste disposal

Like mentioned before wild animals wander in search of food hence when food waste is dumped in open places animals especially bears with their strong sense of smell get attracted .Wild animals venture into urban areas as they are lured by food scraps. The wild Animals scavenge through food and this presence of close proximity between wild Animals and human beings can lead to conflicts as Animals may exhibit aggressive behavior to protect their food source or territory. Insufficient management of waste particularly in place like hotels is becoming the important causes of conflict between humans and carnivores, notably in regions like India. There is a pressing need for thorough research to comprehend the effects of readily available waste on this issue, alongside improved waste handling in carnivore habitats (Somu & Palanisami, 2022). Also they can indirectly cause property damage. The other negative consequences of improper disposal of waste is it may endanger the declining population of wild animals like big cats and bear who when out in human inhabited areas can be vulnerable to lethal weapons when people try to protect their lives. The food that isn't deposited properly when consumed by the animals may cause health issues to them as food meant for human beings can be toxic to the animals and is unnatural for them.

Food shortages

The wild animals like bear and monkeys depend heavily on wild fruits. A wild variety of avocado which the locals called *pumpsi* is a fruit devoured by wild bears. Its ripening season is around November. Around this time venturing into the local market we can see the vegetable and fruit vendors selling this in large amount. They taste like avocados but are much cheaper and hence are favored by the local people. Since people even commercialize the wild fruits which are meant to be eaten by the wild animals these animals have no option but to enter villages in search of their food. The study conducted also showed that people utilize the wild fruits both for self consumption and commercial purpose. Another devoured fruit is wild chestnut locally known as *katus*. Though it doesn't hold the same commercial value as wild avocado but it's still sold in large numbers. The month of November onwards is the hibernation time for Himalayan black bears but their hibernation period is cut short because of shortage of food supply and hence they wander around human inhabited areas.

Months	Number of bear Sightings
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January	1
February	0
March	0
April	0
May	1
June	0
July	0
August	0
September	0
October	2
November	3
December	5

Table2. Figures showing number of bear sightings during 2022. (Source: News Media).

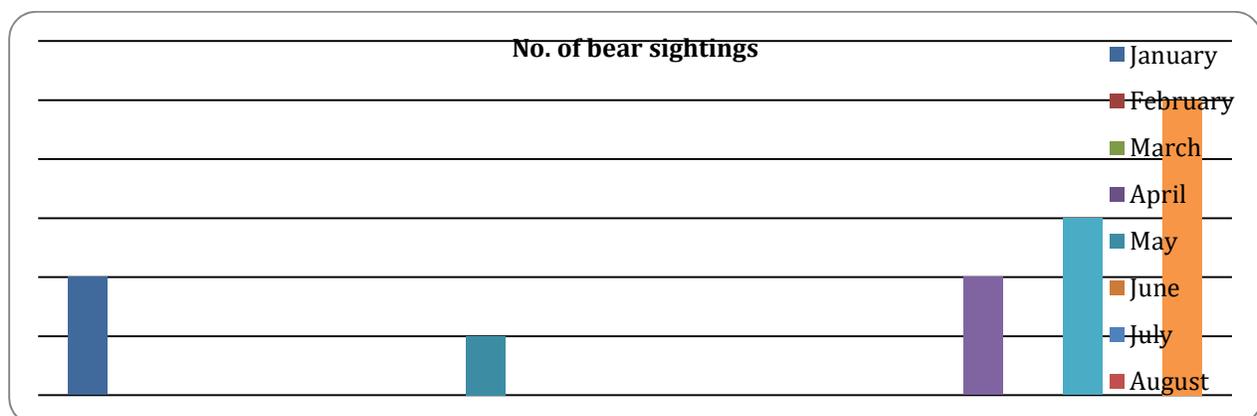


Figure 5. Number of bear sightings month wise data/2022 (Source: News Media).

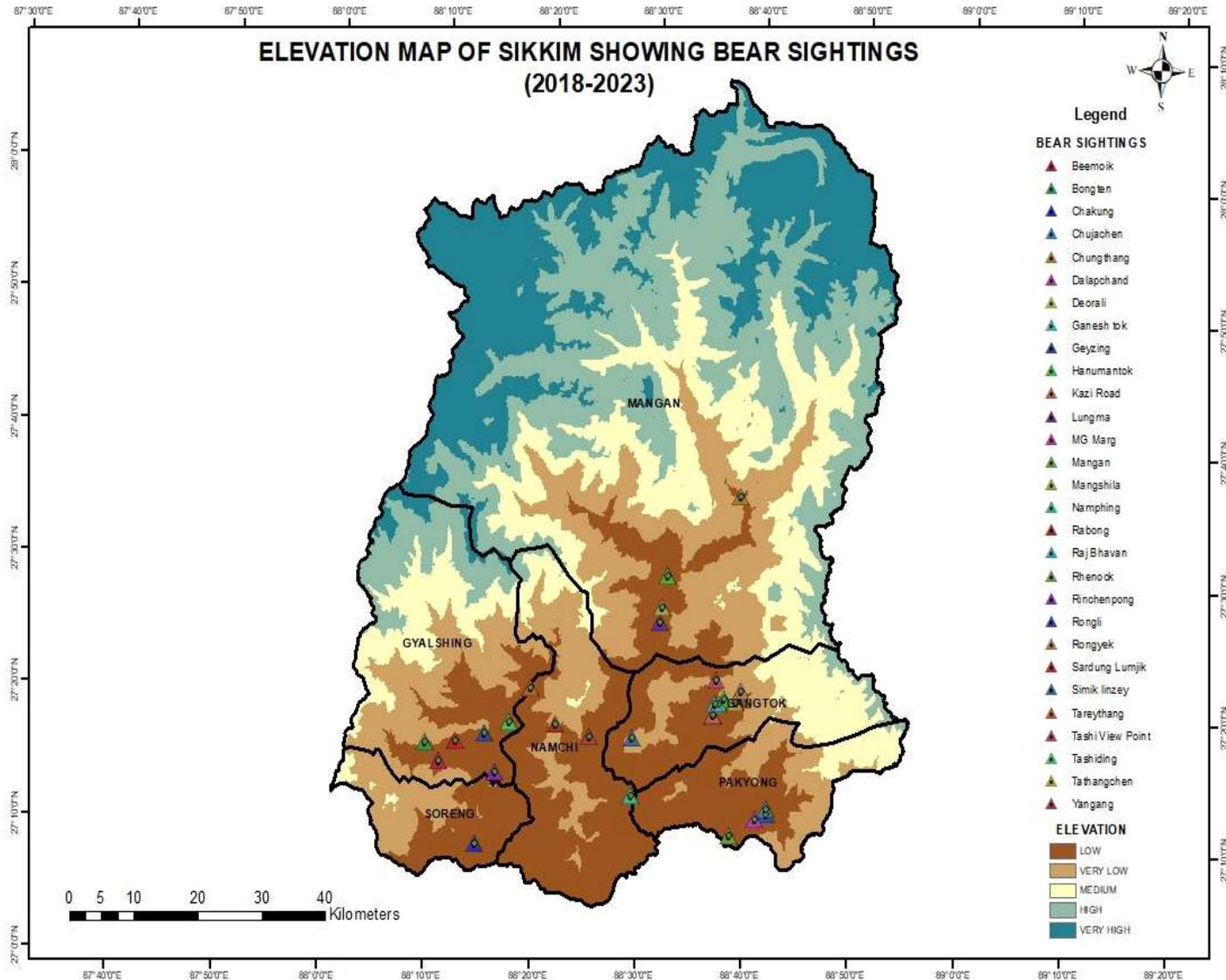


Figure 6. Elevation map of Sikkim showing Bear Sightings between (Source: News Media and Field work 2022-2023).

Climate Change

Climate Change has led to dry spells hence resulting in less fruit production by trees and thus less food resources. The impact of climate change in ecosystem and natural habitats can lead to shift in wildlife behavior and migration pattern thus increasing the likelihood of encounters and conflict with humans. Also due to global warming and altered precipitation patterns leads to loss of critical habitats for wildlife. When the natural habitat of these wild animals start to shrink they venture into human inhabited places.

Suggestions and Conclusion

Addressing human Wildlife conflict requires multi-faceted approaches. The government has taken many initiative to lessen Wildlife attack on crops by allowing the citizens to kill the wild animals if need arises however this can lead to unintended environmental consequences and further worsen the situation. Instead the government should raise awareness about co existence strategies that are essential to mitigate the conflict.

The banning of commercial usage of wild fruits is very important because they serve as a significant food source to wild life hence it should be stricter and through checking of vegetables haats should be conducted .When people consume them it depletes the food resources for animals and to seek food they go to human inhabited areas. By implementing stricter ban the attraction of wild Animals to human areas can be reduced and mitigate conflicts.

Proper waste disposal plays a crucial role in mitigating human Wildlife conflict. Improper waste disposal attracts Animals leading to human Wildlife conflict which is why proper and effective waste management should be implemented .This includes education and awareness campaigns to encourage responsible waste disposal practices among residents. Implementing secure waste disposal which are inaccessible for Animals can help reduce their attraction to urban areas. Introducing composting organic waste and introducing recycling initiatives can reduce improper waste disposal.

Implementation of sustainable land use practices can foster a harmonious relationship between human and Animals as it minimizes the need for Animals to seek resources in human populated areas. It requires a collective approach from individuals/communities and governments where education and awareness among communities about the importance of wildlife conservation and the consequences of human Wildlife conflict can foster understanding and empathy leading to responsible behavior towards wildlife.

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