



HUMAN WILDLIFE CONFLICT OUTSIDE THE PROTECTED AREAS OF MUMBAI: A CHALLENGE

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ABSTRACT

Advanced industrialization in urban areas has led to the destruction and depletion of forest cover which is the habitat of several wildlife animals. This has led to an increased encroachment of wildlife into urban settlements in search of food. The leopard is found in large numbers in the Sanjay Gandhi National Park, a protected area for wildlife, however due to modern urbanization the thin line between the SGNP buffer zone and the habituated regions have perished. As the leopard's home range is disrupted for human activities the animal tends to wander out of his range into urban settlement in search of food. Until recently human life and wildlife coexisted with each other while adjusting and adapting to each other. Due to an eminent increase in forest destruction, this coexistence ceases to exist. When it comes to dealing with the man-animal conflict situation there is a drastic difference in the perspective of tribals versus the city people. The tribals consider the wild animals sacred and members of their tribe however due to a lack of awareness city folk are scared of the wildlife. Urban humans tend to harm the animals in lieu of protecting themselves and further increase the gap between the human animal conflict. The present study is an effort to review the man-animal conflict outside the protected areas of Mumbai, Maharashtra.

Key words: Man-animal conflict, SGNP, urbanization, Leopard.

INTRODUCTION

In earlier times man and animal used to coexist peacefully without causing any harm or injury to the other. However recent developments like industrialization and urbanization have disrupted this harmony. The need for space for urban settlements has led to the destruction of the forest covers which is the natural habitat of a large number of wild animals. As their homes are destroyed the animals are forced to enter the modern cities in search of food and housing. This has led to an increase in the human-animal conflict, both harming the environment of the other. Human-wildlife conflict (HWC) is a term used to describe the circumstance when

the basic needs and lifestyle of humans are affected in a negative way by the interference of animals or when the needs or the existence of animals is in danger due to human activities (IUCN, 2022). The World-Wide Fund for Nature (WWF) defines human wildlife conflict as "any interaction between humans and animals that give rise to an impact of human social, economic or cultural life, on the conservation of wildlife populations, or on the environment." These may also imply when crops are damaged or life of humans and domestic animals are threatened, injured or harmed in any form (Sillero et al., 2001). HWC is a threat not only to humans but animals too and also the

ecosystem. The problems caused by HWC are on the rise and one of the major causes is the increasing encroachment of wildlife animals into cities endangering the human population.

One such example of human wildlife conflict can be observed in the metropolitan city of Mumbai. Sanjay Gandhi National Park (SGNP), located in Borivali, Mumbai, Maharashtra is a unique preserved area that houses a large number of animals including leopards (*Panthera pardus fusca*, Meyer, 1794) among others. Leopards are the top most predator found in SGNP and are important for the social and ecological growth of the park. Ideally the leopard preys on animals within the vicinity of the national park itself, but lately due to destruction caused by manmade activities, availability of prey has reduced and this has caused them to deviate towards their surrounding areas in search of food. There have been various incidents where there is a clash between animals such as leopards/monkeys and snakes in the urban settlements, out of which the most recent incident is of the Aarey colony where two leopards were captured on being suspected to be man-killers. Such cases have been on a rise since 2003-04. Domestic animals found along the park and in its vicinity such as dogs, pigs, cattles, etc are easy prey for the animal. (<http://dairy.maharashtra.gov.in/>). The Goregaon Film city and the Aarey Milk Colony are both located in the southern side of the SGNP. The Aarey milk colony houses more than 30 cattle farms which roughly consist of over 15,000 cattle's (Punjabi et. al., 2012). On an average, 16,000 of these cattle's (buffaloes) and 32 cattle farms are allowed to breed. (<http://dairy.maharashtra.gov.in/>).

It is being speculated that the excess garbage or waste disposed along the sides of the roads attract scavenging animals such as pigs, dogs, etc which in turn attracts leopards towards these areas. (Bhale et al., 2005, Edgaonkar 2002). Also the depletion of the forest covers due to urban activities like building a car shed has led to the reduction of the safe spaces for the animals which drives the animal into the urban populations in search for prey. Leopards have mostly been portrayed in the media in a negative aspect due to the increasing combat between the humans and the animals. They usually portray animals killing each other, humans or other prey. Leopard attacks have been mainly reported from Aarey colony, Goregaon and Sanjay Gandhi National Park in Mumbai, Maharashtra. As these places are one of the few protected areas present in the industrial jungle of Mumbai, Maharashtra, the need for understanding the root cause of all these conflicts becomes a necessity (Nair et al., 2021). The Leopard (*Panthera pardus fusca*, Meyer, 1794), is listed in Schedule I of the Indian Wildlife (Protection) Act in India. (Anon 1972) which is the highest level of protection. Leopards are classified as vulnerable species according to the IUCN Red list. (IUCN 2016). Leopards are known to be found all across the country of India (Athreya et al. 2013, Harihar et al. 2009) and Sri Lanka (A. Kittle and A. Watson, 2014). According to research conducted previously it has been concluded that the numbers of the leopard population has seen a rapid decline due to various reasons such as an increase in the human population which has indirectly led us to the continued killing/hunting of these animals (Selvan et al. 2014, Thorn et al. 2013), an increase in the killing of the

animal and illegally trading them as trophy (Datta et al. 2008), killing the animals unnecessarily for the use of their hides/skins for uses in decoration or ancient medicines (Balme, 2015), massive reduction in the population of prey predator ratio (Lindsey et al. 2014, Selvan et al. 2014, Datta et al., 2008, Fusari and Carpaneto 2006, Toit 2004, Hatton et al. 2001) and poorly managed trophy hunting (Balme et al., 2009).

SGNP is also home to a huge number of tribal populations, who reside inside the national park. There are 43 such settlements found inside the park; some even have access to electricity. Some of the villages inside the park are Yeur and Chena. Most of these people primarily work as labourers, fruit pickers/ cattle farmers (Ramya et al., (2021) in and around the national park, originally agriculture being their main source of income. Although there are no such restrictions for owning and grazing cattle inside the park, which also becomes a primary attraction for the leopards. The present study was an attempt to understand the impact of HWC and the challenges posed by it to the tribal people, city folk as well as the environment.

MATERIALS AND METHODS

STUDY AREA

The Sanjay Gandhi National Park (SGNP), also known as the Borivali National Park, is spread across 104 km² also extending towards some of the suburban portions of Mumbai and Thane (19° 8' N, 72° 53' E and 19° 21' N, 72° 58' E) (Figure 1). The boundary on the South side of the park is formed by the Vihar Lake. Also, areas like Thane, Bhandup and Mulund (Plate 3) and Kandivali, Goregaon, Borivali and Malad (Plate 2) form the boundary on the east and west side of the park respectively. The boundary on the north side of the park extends beyond the Nagla forest block and also includes the Bassein creek (Plate 1). Around 8.5 km² of the entire park is covered in lakes such as the great Tulsi and Vihar lakes which include a wide area of about 8.62 km². For making management of the park easier, SGNP has been divided into three zones namely the core zone of 28.1 km² and the buffer zone of 66.2 km² and lastly the tourism zone of 8.6 km². SGNP is divided into three forest ranges namely the Tulsi, Krishnagiri Upvan and Yeur range. Also, the eastern express highway which connects Mumbai and Nashik runs along the eastern side of the park and the western express highway the NH-8 is almost parallel to SGNP on the western side (Nikit Surve, 2015).



Figure 1: Location of Sanjay Gandhi National Park (Image Source:- Nikit Surve, 2015.)

Methodology

The tribal people living in and around SGNP were questioned about various aspects related to SGNP by personal

interviews and surveys and group discussions. The same way the people residing in the city of Mumbai (specifically Andheri to Borivali) were

questioned and data was generated. The targets involved in this study were a group of literates as well as illiterate people residing in and around the premises of the Sanjay Gandhi national park. Selection of people for the study was random and no one was related to the national park or the government in any aspect.

The questionnaire discussed included questions as stated below:

Urban People:

- Why do you think more and more animals have started encroaching/entering the urban areas?
- According to you, what do you think should be done in such a situation (wildlife entering urban areas)?
- Are you aware of the Human wildlife conflicts occurring around you? If yes, what are your views on it?
- How do you think HWC can be avoided?
- Why are tribal people reluctant to relocate to the city?

Tribal People:

- Why do you think more and more animals have started encroaching/entering the urban areas?
- According to you, what do you think should be done in such a situation (wild animals encroaching/entering the urban areas)?
- Are you aware of the Human wildlife conflicts occurring around you? If yes, What are your views on it?

- How do you think HWC can be avoided?
- Would you relocate to an urban area? If not then why?

RESULTS

A questionnaire was circulated online and offline among tribal people inhabiting in and around SGNP area and the urban people of Mumbai to get an understanding of their perspective regarding the HWC. Personal interviews were also conducted for the same to understand the views of the urban people and tribal's in relation to HWC.

It was found that around 50% of the urban crowd attributed the loss of habitat as the main cause due to which wild animals have started entering into the city areas. 45% of the population cited reasons like search for food and only 5% of people felt that an easy access for the animal to explore are the reasons that the wild animals are encroaching into the urban societies.

Whereas the tribal's felt that due to the destruction of their natural habitat the animals are forced to venture outside their boundaries in search of food (35%). 28% of tribal's felt that the loss of forest cover due to anthropogenic activities has reduced the differentiation between protected and the urban area providing easy access for the animal into the urban settlements.

In such situations of wild animals entering the city area, urban people felt scared. They felt that one should scare the animal away by throwing stones or sticks (40%). 20% of city people when questioned feel that the animals should be killed so as the animals don't cause harm to humans. 40% of people considered the option of rescuing the animals by approaching the

relevant authorities and relocating the animals.

In contrast the 43% of the tribal's feel that the animals should not be harmed at all. They should be rescued and relocated (30%). Also humans should avoid feeding the animals or taking pictures as the flash of the camera can act as an aggravating agent to the animal (20%). 7% of the tribal's feel that they should be killed.

Most of the urban population has knowledge about the human wildlife conflict situation and feel that it can be avoided provided the government intervenes and mitigates relevant laws for the well being of the animals, humans and the environment (65%). 25% of people, although aware of this phenomenon, feel that it is not in their hands to do anything about this conflict. Whereas 10% of the educated urban population are not aware of what HWC actually entails and are not concerned either.

Similarly most of the tribal's are also aware of the human wildlife conflict (80%) however they feel it is unavoidable unless man stops destroying nature for its selfish needs, a small minority of the tribal folk do not understand the human wildlife conflict (20%). The tribal people residing in and around SGNP feel that the habitat of animals should not be disturbed (70%). 30% of tribal's suggested that the animals should be relocated to areas with better resources. The government should take strict action and state laws in favor of the animals

Most of the tribal population be it city bred or the tribal's understand the importance of anthropogenic activities and the consequences of destruction of forest

covers. Individuals feel that the HWC can be avoided by proper management by the BMC and the Government. Destruction of the animal habitats and forest cover should be minimized and animals should be protected and relocated as needed. The public should be made aware and educated on HWC. People are not aware of how to react in such situations. The younger generation should be educated in schools and colleges. The common solution mentioned by all was the relocation of animals at places with better resources for them to survive in their natural habitat without human interference, thus maintaining the balance of the ecosystem. People residing in cities feel that the tribal's should migrate to the city for a better life. They feel that several reasons contribute to the tribal's not moving out of the forest areas which could be a contributing factor in HWC. The reasons mentioned included that the tribal's may be too attached to their home as several generations might have lived there and hence don't want to vacate their homes (33%). Some others felt that the tribal's are dependent on the subsidiaries provided by the government to the tribal people, some of them being providing education. 28% people felt that tribal's are hesitant to relocate as they may not be educated or skilled enough to survive in the urban jungle and earn a livelihood. 17% of the public felt that there is no specific reason but the tribal's are too comfortable and do not want to move out.

When the tribal asked's whether they would move out of their forest or park residences into the city area 90% refused. They were reluctant to leave their home as their life is the forest and they have lived all their lives among the forests. They feel it will be difficult for them to move now.

Also they do not want to give up the subsidiaries provided by the government. Most feel it will be too much of a struggle and don't prefer it.

The people living in cities, although highly educated, are scared of the wild animals and consider them as a threat (75%). The tribal's on the other hand view wild animals like leopards as a religious deity and consider them as a part of their family (70%). They feel the animals are protecting them and unless harmed are harmless to them (30%). They believe animals and humans can co-exist without any trouble.

DISCUSSION

The targets involved in this study were a group of urban as well as rural (tribal) people residing in and around the premises of the Sanjay Gandhi national park. The current study observed differences in opinion and perspective between the two groups. From the current study it can be seen that the urban population are mostly ignorant or inconsiderate towards the problem of HWC widespread in the area. Whereas the tribal people are trying their best to find ways to co-exist along with the animals in their habitat.

The comparison was made based on the views of the urban and the tribal people on the ongoing Human wildlife conflicts occurring in Mumbai city specifically SGNP - Aarey colony area.

From the present study, it can be said that the city dwelling people accredit the loss of habitat as the main cause due to which wild animals have started entering into city areas. Other reasons considered were in search of food, due to loss of habitat due to anthropogenic activities and lastly being easy access for the animal to explore. Similar views were also discussed by other

authors. Athreya et al., (2018, 2016) reviewed the situation wherein leopards enter the city areas in search of food. He considered the reasons like easy domestic prey availability. It can be said that man is the main cause for the destruction of nature and the increase in the HWC. Various anthropogenic activities are giving rise to the human-wildlife conflicts in India (Manral et al., 2016).

Tribal people as well as city dwellers felt that the best option to deal with the situation of animals entering into the cities is to calmly take action by approaching the appropriate authorities and rescuing the animals and further relocating the animals. This view is supported by other researchers (Pradhan 2018, Athreya et al., 2010) that it is important to not harm the animal and instead rescue the animal.

The current study exhibited views of the urban people where they feared the animals and were not entirely aware of how to deal with situations of wildlife like leopards entering into the urban settlements. From this perspective the conflict will result in killing of animals. (Dressel et al., 2015; Madden & McQuinn, 2014). Human activities cause an increase in the alteration of wildlife habitat resulting in decline of wildlife populations.

Edelblutte et al., (2014) in his work discussed the possibility of moving the tribal's out of the forests into the city area. He presented data wherein the tribal people avoided eviction by the influence of the local politicians, BMC officials, forest officers, and slumlords and also developed strategies to secure their daily lives. FRA also states that people can be evicted if this is essential to the protection of wildlife, although relocation and economic compensation must be offered.

Similar response was observed in the current study where the tribals refused to vacate their land in the forest and move to the city. Tribals are set in their ways and also they do not want to lose out on the government subsidiaries and other perks received.

Majority of the tribal population consider the animal as their protector and worship the animal. They believe the animal will in turn protect them. According to the tribal crowd leopards are harmless unless threatened, which means that the animal will not attack unless provoked thus stated that peaceful coexistence between man and animal is possible Similar views were discussed by Athreya et al., (2018). This knowledge is derived from the ideology of the people worshiping the big cats “Waghoba”. They do this by visiting their shrines and offering the animal offerings. Some people also find solace and peace in the presence of such animals.

Anand and Radhakrishna (2017) discussed the situation of the human-wildlife conflict as a global issue encompassing events detrimental to both human beings as well as wildlife. The current research also highlighted the same aspect wherein most of the population urban and tribal understand the importance and impact of HWC on the planet.

According to the report released by the forest department of Maharashtra over 105 people had lost their lives due to human wildlife conflict in the state of Maharashtra in the year 2022, among which 7 leopards are still being held in captivity. Recent news shows that leopards have deviated from preying on stray dogs and other domesticated animals to attacking humans, mainly young children

are targeted as they are easy prey due to them being defenceless.

Research activists like Redpath et al., 2022 studied the conflicts from a world perspective and have tried finding solutions to the HWC problem from a financial point of view. He suggested dealing with this problem from the grass level. Damage to the ecosystem has an impact not only on the animals but humans too. Every individual be it man or animal has different interest and it is necessary to deal with all perspectives in order to bring a balance to the environment (MacDonald and Service, 2007). As per Peterson et al (2010) HWC is a highly problematic situation and the literature available suggest albeit falsely that the animals are the antagonists in the conflict.

Majority of the population feel the need of the government to intervene and play the main role in resolving the human wildlife conflict. On 5th January 2021 the government of India approved an advisory for the management of the human wildlife conflict of the country. The advisory is involved at a state and national level, mitigating laws and adopting early warning systems and strategies to improve the HWC in the country (Ministry of Environment, Forest and Climate Change, 2021).

HWC has the potential to impact the economy of the country and improvement measures that aid in reestablishment of the animal species is the need of the hour (Messmer et al.,1997a; Fall and Jackson, 1998, Messmer, 2000).

The present work reviewed the perspectives of people residing in urban settlements and the tribes residing in the forest/ park area in order to understand the aspects and challenges that the conflict can

cause. Based on the present study the following can be concluded:

Firstly, it is important to raise awareness and educate the public, especially the younger generation, about the causes and consequences of HWC. This can be done through school and college education programs, community awareness campaigns, and the dissemination of educational material in the local language. This will enable people to better understand the perspectives of both urban and tribal populations and will help to build empathy towards the challenges faced by both.

Secondly, it is important to minimize the destruction of animal habitats and forest covers caused by anthropogenic activities. This can be achieved by implementing strict laws and regulations to protect wildlife and their habitats. The government should also take appropriate measures to relocate wild animals to areas with better resources for their survival.

Thirdly, it is crucial to involve all stakeholders in HWC mitigation efforts, including urban and tribal populations, the government, non-governmental organizations (NGOs), and experts in wildlife management. Collaboration between these stakeholders will be necessary to develop effective strategies to mitigate HWC and to ensure the safety and well-being of both humans and animals.

Fourthly, it is important to address the misconceptions and fears associated with HWC. This can be done through community awareness campaigns, by highlighting the importance of coexistence between humans and animals, and by

promoting safe and responsible behaviour in the event of an encounter with a wild animal.

Fifthly, it is important to recognize the cultural and social significance of wild animals to tribal communities. Efforts should be made to promote cultural sensitivity towards tribal communities and to involve them in the decision-making process when it comes to HWC mitigation efforts.

Lastly, it is important to provide alternative livelihoods and opportunities to tribal communities living in or around protected areas. This will enable them to move away from traditional forms of resource extraction and reduce their dependence on forests and wildlife for their subsistence.

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