



Human-monkey conflict in human dominated landscape of Najibabad forest division, Bijnor

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ABSTRACT

Conflicts between humans and monkeys are recognized among major issues related to human-wildlife conflict. Today, human-monkey conflict has garnered the global attention as over the years it has become a serious concern. The present study was done in the human dominated landscape of Najibabad forest division (NFD). The data were collected from 2015 to 2018. The study aimed to assess the damage caused by monkeys on human-society and crop fields. The study showed that biting humans, destroying orchards, crops and stealing household things are the major damages caused by rhesus macaques (*Macaca mullata*). Destruction of habitats, over-population, and improper disposal of wastes are the main causes of human-monkey conflict and the monkeys also face threat in such situations. Hostile attitude of people and transportation of trapped monkey to release them in forest causes injuries or even death of monkeys.

Keywords: Human-monkey conflict, Human settlements *Macaca mullata*, *Oryza sativa*

Humans have an uneasy relationship with wild animals since the dawn of human evolution as they preyed upon and competed for available resources with wild animals (Knight, 2013). The rhesus macaque (*Macaca mulatta*) is one of the species of non-human primates found in India. They are widely distributed throughout the Indian subcontinent and are highly adapted to human proximity and have learned to exploit human habitation. The rapid increase in the number of rhesus monkey population in recent times has led to increased competition for food and space between human and monkey (Srivastava, 1999). Damage to human property and harassment by the monkeys are the common feature in various parts of India. Although large population of monkeys are found in the North-western India, very little systematic efforts have been made to know the cause of monkeys invading the human settlement areas which leads to human-monkey conflict. The NFD, Bijnor (Uttar Pradesh) have a large and viable population of rhesus monkeys and exemplifies cases of human-monkey conflict.

HWC is a common problem of the world but in India the scenario of this problem is quite serious. Human-wildlife conflict is a common phenomenon that affects the people as well as wildlife. When wild species affects the life of a human being in the form of attacks, damage their livestock, property and the crop this is considered as human-wildlife conflict (HWC). Many wild animals are found problematic such as wild boar (*Sus scrofa*), tiger (*Panthera tigris*), leopard (*Panthera pardus*), nilgai (*Baselaphus*

tragocamelus), elephants (*Elephas maximus*) but out of these, the non-human primates such as monkeys known as rhesus macaque (*Macaca mulatta*) contributes a lot in this. As per the religious and traditional beliefs of the Hindu community of India, monkeys are venerated as a representative of the deity Hanuman and people feed them which in turn results in increasing population of monkeys. It has been observed that monkeys are involved in agriculture damage, damage of household and even human casualties (Kumara *et al.* 2010).

In this study an attempt has been made to understand the status and find out possible causes of human-monkey conflict in the human settlement of the NFD.

MATERIALS AND METHODS

Study area: The study was conducted in urban and rural areas including three towns (Najibabad, Saharanpur, Badhapur) and 140 villages of five ranges of NFD from 2015 to 2018. The study was conducted in the village areas of NFD (29.63° N, 78.33° E) in the Bijnor district (29.37° N 78.13° E) of Uttar Pradesh State of India. The forest division includes five ranges namely Kaudiya, Badhapur, Sahuwala, Saharpur, Rajgarh and three development blocks (Kotwali, Najibabad and some part of Afjalgarh) which are adjacent to the NFD and covers an area of 390 km². The headquarter of the forest division is located at Najibabad. The northern side of the NFD is attached to the Lansdowne forest division, while the eastern side is attached to the Corbett Tiger Reserve, famous for tiger conservation. Climate wise study area is warm and temperate with three

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seasons, viz. rainy season (June to September), winter (October to February) and summer (March to May).

Wheat (*Triticum aestivum*), sugarcane (*Saccharum officinarum*), rice (*Oryza sativa*) and the pulses such as black gram (*Vigna mungo*), pigeon pea (*Cajanus cajan*) etc. are among the crops cultivated in the study area. Some vegetables such as brinjal (*Solanum melongera*), cauliflower (*Brassica oleracea*), pea (*Pisum sativum*), tomato (*Solanum lycopersicum*) etc are also cultivated by the farmers.

Information of monkey bites was collected from the Government Hospitals of Najibabad and Nagina. Information collected was cross checked with the records of Gram panchayats and affected peoples were interviewed using questionnaire format.

Two types of questionnaires were designed for this study. One was for urban area which covers the information of problematic animals such as monkeys in concern area, bites, awareness of treatment, attitudes towards wild animal and other problems due to monkeys. Another was designed for the rural area which covered the information regarding crop damage. Household surveys were conducted and the individuals were interviewed randomly. Data collected was used to determine status and nature of crop damages due to rhesus macaque, information regarding monkey bites and affected peoples, and respondents views towards conflict and mitigation measures.

RESULTS AND DISCUSSION

Incidences of monkey bites: During the survey period an increase in the incidences of monkey bites was observed. During 2015–16 there were 117 total cases of bite while in 2016–17 and 2017–18 there were 132 and 147 cases respectively. The study was conducted in 140 villages in which 58 villages were found affected. There were more incidences of bites in male human beings (214) than females (182) which could be due to more involvement of males in outdoor activities as compared to females (Table 1). As far as age group is concerned, overall people below the age of 15 years were most susceptible (40%, n=158) and victims of most of the monkey bites in comparison to other age groups (Table 2). Three persons in the study area, one each from Pajaniya village, Nagina city and Najibabad city died due to injuries inflicted in human-monkey conflict.

In 2014 villagers of Kalhedi (NFD) poisoned the monkeys and 20 monkeys were found dead. Similar incident happened in 2018 at Dabarsi village of Amroha district,

Table 1. Details of incidences of monkey bites in human settlements of NFD

Year	Biting incidences (%)	
	Male	Female
2015–16 (n=117)	53.0	47.0
2016–17 (n=132)	56.8	43.2
2017–18 (n=147)	52.4	47.6

Table 2. Details of incidences of monkey bites among different age groups of the victims in the human settlements of NFD

Year	Age of the victims (%)			
	Below 15	16–35	36–55	56 Above
2015–16 (n=117)	38.4	28.2	20.5	12.8
2016–17 (n=132)	40.1	29.5	16.6	13.6
2017–18 (n=147)	40.8	27.8	22.4	8.84

where about 100 monkeys found dead due to consumption of an insecticide used for killing of rats.

Crop damage: People living in forest fringe villages in the study area claimed crop raiding by the rhesus macaques as a serious and significant issue of human-monkey conflict. During the study period it was observed that out of the total 140, 58 villages located adjacent to forest were found affected due to rhesus macaque. The farmers claimed 20–30% damage to their legumes and vegetables crops due to monkeys. In the study area there are many mango orchards and owners of orchards claimed 20–25% annual damage to mango crops due to monkeys. Similar incidences of crop damage have been reported by other workers (Blanford 1888–91, Roonwal and Mohnat 1977, Ahsan and Mazbahuddin 2014).

Damage of crops by the rhesus macaques is also reported from the different parts of India and the other countries (Saraswat *et al.* 2015, Dela 2011, Nahallage and Huffman 2013).

Now a days, macaques are acting aggressively towards the people they attack people to grab food, snatch hand bags and the people are also acting aggressive in return towards them (Dittus 2012).

Due to the intolerable activities a majority of the residents of the study area strongly believe monkeys as unwanted species than a species of conservation.

Things affecting the human-monkey conflict

Availability of food: During the study period we observed that the availability of food items for monkeys in human settlement is more than the availability in forests as there are so many orchards and fruit trees in the human settlements. Degradation of forests due to illegal encroachment of forest lands for housing and agricultural purposes, extensive cutting of forest trees and plantation of exotic tree species in place of natural food plants forces the rhesus macaques to invade the villages/human settlements which provide a wide range of food plants to them (Table 1).

Improper waste disposal: The improper disposal of wastes also accounts for the prevailing human-monkey conflict in the study area. Careless dumping of kitchen wastes and garbage in the open areas provides easy food for the monkeys, which results in their frequent visits to the study area. (Devi and Saikia 2008).

Roadside accidents: The huge population of macaques living along the sides of the roads in the study area and the

Table 3. List of native and exotic plant species and their parts eaten by rhesus macaque in Najibabad forest division

Family	Scientific name	Common name	Parts eaten
Anacardiaceae	<i>Mangifera indica</i>	Mango	Fruit, flower
Moraceae	<i>Artocarpus heterophyllus</i>	Jackfruit	Fruit
Musaceae	<i>Musa sapientum</i>	Banana	Fruit
Solanaceae	<i>Solanum tuberosum</i>	Potato	Fruit
Solanaceae	<i>Solanum melongera</i>	Brinjal	Fruit
Solanaceae	<i>Solanum lycopersicum</i>	Tomato	Fruit
Poaceae	<i>Saccharum officinarum</i>	Sugarcane	Stem
Myrtaceae	<i>Psidium guajava</i>	Guava	Fruit
Fabaceae	<i>Viaga mungo</i>	Black gram	Seed
Fabaceae	<i>Cajanus cajan</i>	Pigeon pea	Fruit
Fabaceae	<i>Vigna munga</i>	Black gram	Fruit
Fabaceae	<i>Lablab purpureus</i>	Hyacinth bean	Fruit
Fabaceae	<i>Pisum sativum</i>	Pea	Fruit
Cucurbitaceae	<i>Lagenaria siceraria</i>	Bottle guard	Fruit
Cucurbitaceae	<i>Luffa acutangula</i>	Ridge guard	Fruit
Cucurbitaceae	<i>Curumis sativus</i>	Cucumber	Fruit
Cucurbitaceae	<i>Cucurbita pepo</i>	Pumpkin	Fruit
Malvaceae	<i>Abelmoschus esculentus</i>	Lady finger	Fruit
Brassicaceae	<i>Brassica oleracea</i>	Cauliflower	Flower

two National highways (NH-119 and NH-74) increases the possibilities of the deaths due to road accident. Dozens of monkeys can be seen injured or dead while crossing road every year. We visited study area four times in a year and recorded a total of 56 casualties during the entire study period. Similar incidences were reported in Karnataka (Hatti and Mubeen 2019).

Emerging negative attitude towards monkeys in the society: In our country the majority of the peoples (Hindu community) respect monkeys like a deity, worship them and provide food but on the other hand due to increasing human-monkey conflict negative attitude is also emerging towards monkeys. People have started shooting or killing monkeys using poisoning.

Is the population of rhesus macaque increasing rapidly?

This is the question rising in mind of conservationists. The groups of monkeys are being shifted from one place to another place in the search of food availability and shelter. However, it has been observed that while transporting a number of monkeys either suffer from severe injuries which sometimes also results into deaths.

Possible measures to minimize the problem

Short term

- Immediate prohibition on food provisioning by the residents.
- Capture, sterilization and translocation of the monkeys to the wildlife sanctuaries and zoos.
- Mass chasing of the monkeys out of the study area by using sticks, drums and crackers etc.
- Proper dumping of kitchen wastes and garbage.
- Immediate prohibition on the shifting of monkeys from one place to another place by the Municipality and other private authorities.

Long term

- Strict control on illegal encroachment of the forest lands.
- Regulation on cutting of trees and plantation of exotic tree species must be controlled as per scientific guidelines.
- Promoting conservation education and public awareness programmes among the residents.
- Select sites where the monkeys can survive without conflict such as good forested habitats and religious places and put measures to regulate the population within the carrying capacity of such places.

Shortage of feeding items in forested habitats due to various reasons and rapid increase in rhesus monkey population is the major cause of human-monkey conflict. There has been consistent increase in monkey population over the years. Besides, habitat fragmentation and degradation, encroachment of human in forests are the important causes of the increasing human-monkey conflict.

The preventive measures such as preventing degradation of natural habitats imparting knowledge to locals to deal with human-monkey conflict by organizing workshop and awareness campaigns, proper dumping of kitchen wastes and garbage, translocation of the monkeys to the wildlife sanctuaries and zoos should be taken. Providing knowledge to people about the problem and necessary precautions to be taken to minimize sudden encounters would help people to minimize the loss in the area (Cabral *et al.* 2018).

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REFERENCES

- Ahsan M F and Uddin M M. 2014. Human-rhesus monkey conflict at Rampur village under Monohardiupazila in Narsingdi district of Bangladesh. *Journal of Threatened Taxa* **6**(6): 5905–08.
- Blandford W T. 1988–91. *The fauna of British India including Burma and Ceylon*. Taylor and Francis London. 500 pp
- Dela J D S. 2011. Impact of monkey-human relationships and habitat change on *Semnopithecus vetulus nestor* in human modified habitats. *Journal of the National Science Foundation of Sri Lanka* **39**(4): 365–82.
- Devi O S and Saikia P K. 2008. Human-monkey conflict: a case study at Gauhati University Campus, Jalukbari, Kamrup, Assam. *Zoos' Print* **23**(2): 15–18.
- Dittus W. 2012. An online forum for exchanging ideas for dealing with issues of pest monkeys. *Journal of Primatology* **1**: 1–2.
- Knight J. 2013. Natural enemies: People-wildlife conflicts in anthropological perspective. *Routledge*.
- Kumara H N, Kumar S, and Singh M. 2010. Of how much concern are the 'least concern' species? Distribution and conservation status of bonnet macaques, rhesus macaques and Hanuman langurs in Karnataka, India. *Primates* **51**(1): 37.
- Nahallage C A. and Huffman M A. 2013. Macaque-human interactions in past and present-day Sri Lanka. *The Macaque Connection*, New York. 135–48.
- Roonwal M L and Mohnot S M. 1977. Regional Primatology. (Book Reviews: Primates of South Asia. Ecology, Sociobiology, and Behavior). *Science* **198**: 724.
- Saraswat R, Sinha A, and Radhakrishna S. 2015. A god becomes a pest? Human-rhesus macaque interactions in Himachal Pradesh, northern India. *European Journal of Wildlife Research* **61**(3): 435–43.
- Cabral S J, Prasad T, Deeyagoda T P, Weerakkody S N, Nadarajah A, and Rudran R. 2018. Investigating Sri Lanka's human-monkey conflict and developing a strategy to mitigate the problem. *Journal of Threatened Taxa* **10**(3): 11391–98.
- Srivastava A. 1999. *Primates of northeast India*. Megadiversity Press.
- Hatti S S. and Mubeen H. 2019. Roadkill of animals on the road passing from Kalaburagi to Chincholi, Karnataka India. *Journal of Threatened Taxa* **11**(7): 13868–74.