

Human-Monkey Conflict: A Case Study at Gauhati University Campus, Jalukbari, Kamrup, Assam

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Introduction

The Rhesus macaque (*Macaca mulatta*) is one of the species of non-human primates found in India. They are widely distributed throughout North and Northeast India and are highly adapted to human proximity and have learned to exploit human habitation (Srivastava, 1999). 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 monkeys (Srivastava, 1999). Damage to human property and harassment by the monkeys are the common feature in many parts of India. Although large population of monkeys are found in Northeastern India, very little systematic efforts have been made to know why the monkeys invade human settlement areas which leads to human-monkey conflict. The Gauhati university campus harbours a large and viable population of rhesus monkeys and exemplifies cases of human- monkey conflict. Therefore, keeping the above facts in view, the present study was conducted to obtain basic information on the damage caused by the monkeys on humans in the Gauhati University Campus with the following objectives:

- 1) To assess the total free ranging Rhesus macaque's population in the Gauhati University Campus.
- 2) To find out the damage caused by macaques on humans and properties.
- 3) To find out the possible causes of the prevailing human-monkey conflict.
- 4) To find out possible measures to minimize the problem in the study area.

Study Area

The study was conducted at Gauhati University Campus, Jalukbari, Kamrup District, Assam, India for a period of 1 year starting from June 2004 to May 2005. The Gauhati university campus harbours a viable and observable Rhesus Macaque population and exemplified the problem of human-monkey conflict in the area. The study area is situated between 26°12' N latitude and 91°5' E longitude and is 150 ft above mean sea level. The mighty river Brahmaputra flows on either side, making this area a part of the Brahmaputra valley. The vegetation types found in the area are moist-mixed deciduous forests, semi-evergreen forests and scattered deciduous forests. Degraded and Shrub types are also found here. The overall climatic condition of the area could be divided into four seasons viz. Pre-Monsoon (March-May), Monsoon (June-September), Pre-heating monsoon (October-November) and winter (December-February).

Method of Study

The following methods were employed in the study:

1) Population Survey: A population survey was conducted to find out the total population of rhesus macaques in the Gauhati university campus by using Total count method (Bibby *et al.*, 1992), a direct method of population estimation by visual count, to collect the required samples representing the entire population size for a period of 1 year starting from 1st June up to 31st May 2005. During the survey period, the macaques were observed directly using binoculars and naked eyes. Two field trips were conducted within a week and 8 trips a month. The macaques were counted from early morning 5am up to 9am and from 3pm to 6pm in the evening. The counting was repeated for three times to reduce the error component.

2) Collection of records: Data regarding the attack of macaques on human were gathered as per the pre prepared question sheet (*Appendix I*). Household surveys were conducted and the individual people were interviewed randomly.

Results

From the population survey it was found that, the total number of Rhesus macaque (*Macaca mulatta*) population was 270 within study area. Those individuals were distributed in four separate troops with a group sizes of 73, 64, 82 and 51 individuals respectively in each troop (Table-1).

Again, a total of 27 cases of monkey bite and 49 cases of aggressive threats were reported, with physical attacks in the form of scratching by nails, biting by their canine teeth and mass chasing of people, during survey period. Out of 27 individuals bitten by the monkeys, 13 were women, 10 were children and only 4 were adult men. Also, a total of 23 out of 49 cases of aggressive threats were women, 17 were children and 9 were adult men (Table-2). According to the collected data, all those cases occurred when the monkey tried to snatch the food items and clothes from the people and houses. The macaques become aggressive and bite the people, when they try to stop the monkeys from taking away food and household items. From the study, it was also found out that the male monkeys resort to such acts more than the females. These attacks happened very commonly when the macaques invaded human settlements for food and shelter. The cases of monkey attacks outside the human settlement areas were very

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Appendix-I: Questionnaire used for Data collection during survey

1. What are the problems you all are facing from the Rhesus macaques?
2. Do the monkeys come in groups or in single?
3. If they come in groups, how many monkeys form a group (approx.)?
4. Is the group lead by a single dominant male or by a group of males?
5. What did they do after entering the campus?
6. Is there any specific time for their arrival?
7. Where did they come from?
8. Is there any particular item they generally target? If yes, specify.
9. Did the monkeys ever attack you or any of your family members? If yes, please comment, what happened and when did it happened?
10. Did the male monkeys attacked on people more or the female monkeys? Can you identify them?
11. What circumstances make the monkeys resort to harassing and biting humans?
12. What might be the possible causes of the monkey's invasion in this area?

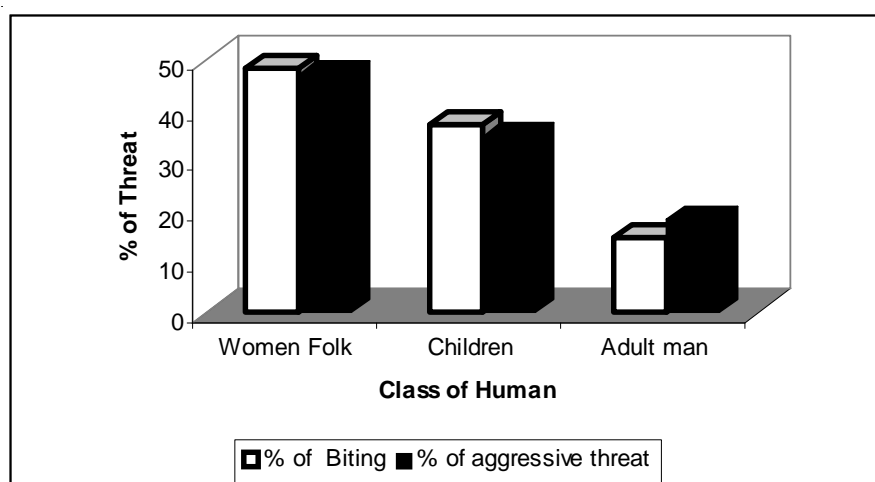


Figure-1: Showed the percent of aggressive threat and attacks by monkeys to human beings in the Gauhati University Campus.

Table-1: Population of Rhesus macaques (*Macaca mulatta*) on the basis of age and sex.

Group	Adult male	Adult female	Juvenile	Infant	Total
I.	11	27	16	19	73
II.	09	23	15	17	64
III.	15	32	22	13	82
IV.	07	19	13	12	51
Total	42	101	66	61	270

Table-2: Frequency percentage and proportional occurrences of threat factors to human population caused by Rhesus macaques in Gauhati University campus and its surrounding villages.

Class Human	% of Biting	% of Threat	Proportion to	
			Biting	Harassment
Women Folk	48.14(13)	46.93(23)	0.57	1.77
Children	37.03(10)	34.69(17)	0.59	1.70
Adult man	14.81(4)	18.36(9)	0.44	2.25

NB: parenthesis of the table indicated the numbers of observations.

Table-3: A comprehensive list of food plants species and its parts eaten by Rhesus macaque in Gauhati university campus.		
English name	Scientific name	Parts eaten
Mango	<i>Mangifera indica</i>	Fruits, flower, seeds
Litchi	<i>Litchi chinensis</i>	Fruit
Guava	<i>Psidium guajava</i>	Leaf, fruit
Banana	<i>Musa sapientum</i>	Fruit
Jack fruit	<i>Artocarpus heterophyllus</i>	Fruit
Indian plum	<i>Ziziphus jujuba</i>	Fruit
Banyan tree	<i>Ficus bengalensis</i>	Leaf, fruit
Peepul tree	<i>Ficus religiosa</i>	Leaf, fruit
Sal tree	<i>Shorea robusta</i>	Pith of twig, leaf, flower, fruit, shoots, buds
Jasmine	<i>Jasminum multiflorum</i>	Stem, leaf, flower
Sisso	<i>Dalbergia sisso</i>	Leaf, seed, bud
Black cutch/catechu	<i>Acacia catechu</i>	Seed
White mulberry	<i>Morus alba</i>	Bud, new leaf, fruit
Kadam	<i>Anthocephalus cadamba</i>	Fruit

occasional and rare. From the study, it was also known that, the women and children were bitten and attacked more frequently than the adult men (Figure 1).

From the study, it was also found out that the monkeys not only attack humans, but also they destroy and damage valuable human properties. Although an economic estimate has not been done during the survey period to estimate the costs of economic loss, the damage caused by the monkeys in the study area is worth mentioning. The items they damaged were things such as silk clothing, all types of cultivated crops, fruits and vegetables of local villagers (mainly for sale in the daily markets), etc. A thorough study regarding economic loss is required.

Causes of the Man-Monkey Conflict in the Study Area

1) Habitat destruction

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 forced the Rhesus macaques to invade the Gauhati university campus which provided a wide range of food plants for them (Table-3).

2) Overpopulation

Increase in the number of monkey population from about 50 individuals to 270, comprising four groups in recent time as well as increase of human settlements in this area since 1993, leads to scarcity of food and shelter for the monkeys thus increasing the conflict.

3) Food provisioning by the residents

Beside habitat destruction and overpopulation, food provisioning by local residents and students of the Gauhati university girls hostels in the name of religion is also another major cause of the conflict. Many people regard monkeys as sacred animals resembling "Hanuman", the powerful mythological

character in *Ramayana*, thus show affection by offering eatables whenever the monkeys visit the area. This attracts most of the monkeys in the area thus increasing the conflict.

4) Improper waste disposal

The improper disposal of wastes also account 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 university campus premises.

Discussion

Although the Rhesus macaque is widely distributed in Assam, their abundance in certain areas is relative to the local topography, forest types, vegetation patterns and agricultural practices. Extensive cutting of forest trees, illegal encroachment of forest lands and plantations of exotic commercial plants in place of the natural food plants seem to have forced the Rhesus macaques to invade human settlement areas for their own survival.

A majority of the residents of the Gauhati university campus have expressed strong dissatisfaction over the presence of the rhesus population in their localities. Due to their intolerable activities, people now view them as a vermin species rather than a species of conservation importance. The residents were even more apprehensive of increased degree of the conflict in the coming years as they speculate that the rhesus population will not decrease. Despite ceaseless efforts to convince the state government agencies to come up with a concrete solution to the problem in the university campus and surrounding village areas, they have no choice but to bear the pain and losses.

Long term studies in selected habitats are needed to monitor the rates of population increase among the Rhesus macaques in the Gauhati university campus areas. This would give a clearer picture as

to what extent the prevailing conflict may cause damage to the residents in relation to the rate of population changes of the Rhesus macaques in the particular area.

In the present study, regarding remedial measures more than 69% population interviewed prefer translocation and about 22% of them suggested that sterilization of male monkeys and some method of birth control such as immunocontraception should be applied. Only 29% of the survey respondents seemed unhappy enough with the monkeys to suggest that a punitive method such as shooting them would be the most suitable solution to the problem.

Crop raiding by Rhesus macaque (*Macaca mulatta*) is also a serious problem in different parts of its distribution (Chalise, 1997; Ghimire, 2001; Miah *et al*, 2001). Biquand (1994), used birth control methods on an experimental basis on the Hamadryas Baboons to combat crop damage problems in isolated areas of Saudi Arabia. This method is highly labour-intensive and costly, however, keeping in view the religious sentiments against killing of monkeys in India, birth control measures seem to be a more socially accepted option.

To understand the depth of damage caused by the monkeys in the Gauhati university campus and surrounding village areas, we need to conduct a long, comprehensive study with specific focus on the level of monkey abundance in different geographical and agro- climatic regions and most importantly, on the community participation programme for the monkey management and habitat conservation programme in areas with high economic damage.

Recommendations

Both short-term and long-term measures can be adopted to control the man-monkey conflict in the study area.

Short-term measures

Short-term measures aimed at providing immediate relief to the people such as:

1. Immediate ban on food provisioning by the residents.
2. Capture, sterilization and translocation of the monkeys to the wildlife sanctuaries and zoos.
3. Mass chasing of the monkeys out of the area physically by using sticks, drums and crackers etc.
4. Proper dumping of kitchen wastes and garbage.

Long-term measures

Long- term measures aim at removing the factors responsible for the monkey depredation and at creating ideal living conditions for the monkeys within the forests viz:

- 1) Ban on illegal encroachment of the forest lands.
- 2) Extensive cutting of trees and plantation of exotic tree species must be minimized.

- 3) Promoting conservation education and public awareness programmes among the residents.

Precautionary Measures

Besides these recommendations some precautions can also be adopted to minimize direct encounter with the monkeys.

- 1) People should stay within their houses when large groups of monkeys are approaching in close proximity to their houses.
- 2) People must not let their children go out to play in the open if the monkeys are nearby.
- 3) People should be warned not to cause any injury to an infant monkey, as mother monkeys are very aggressive.
- 4) It is advisable to keep their doors and windows shut properly whenever the monkeys visit their localities.

Conclusion

Finally from the findings of the present study, the following conclusions were drawn:

- 1) The basic reason for man-monkey conflict in the area is the rapid increase of rhesus monkey population in relation to 13 years back. As per the local people, the total population size was not above 50, 13 years back and they moved in one troop. Now, however, as per the population survey conducted the total population of rhesus monkey was found to be 270 comprising four separate troops.
- 2) Habitat destruction and encroachment of human on the habitat of monkeys are the important causes of the increasing human-monkey conflict.
- 3) Habitat improvement with the help of the forest department and local people may be tried out to see if it would minimize the attacks and harassments on people resulting out of long forays by monkeys outside forest areas. Education of people about the problem and precautions to be taken to minimize sudden encounters would at least help people in the area.

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