

### 13. SUMMARY

Damage of crops by primates is a common phenomenon in various part of the world for several decades. Among primates rhesus monkeys are involved in this kind of damage in major way because of their ability to survive in human ecosystems. Malda district of West Bengal is very famous for mango production. This study attempts to discuss extent of mango cultivation in different blocks of the district, monkey population in extensive and moderate mango cultivation areas, injuries incurred by various human age-sex classes through monkeys and to assess the impact of mango cultivation on the ecologic and socio-economic aspects of the people in the district.

The district receives on average 1400mm rainfall per year, the mean maximum and minimum temperature is 36<sup>0</sup>C and 16<sup>0</sup>C respectively. The land area of the district is 3733 sq. km. with a total population of 3.29 million. The district comprises of 15 blocks and the total area under mango cultivation of the district is 24,560 hectares. Most of the rivers of the district are flood-prone and inundate vast areas in monsoon almost every year. The rhesus macaque population in the study area is estimated to be around 850. Mango and silk are the main produces of the district.

The monkeys inhabit in several types of habitats such as mango orchards (19,570 hectares), crop field (21,770 hectares), grassland (30,000 hectares), households comprising of more than 20,000 thousand units distributed in scattered pattern in the villages and patchy in towns and roadside habitats in the blocks containing extensive and moderate mango cultivation orchards.

Altogether about 4,702 monkeys were sighted belonging to 480 groups of small, medium and large sizes over the 7 years study period. The average group size was 9.83 in the mango season and 6.66 in the non-mango season. The group composition was similar to the usual pattern i.e. adult male (15.21%), adult female (32.63%), juvenile (26.39%) and infants (25.86%). The density of rhesus macaques varied over the years from 3.62 to 4.22 per sq. km. in the mango season and 2.17 to 3.21 per sq. km. in the non-mango season. Most (45.60%) births

occurred in the hot-humid months of May, June and July. Most females gave birth to infant every year. Gross mortality rate was more than 45%.

Eight behaviour patterns i.e. feeding, resting, locomotion, grooming, playing, aggressive, sexual inspection and copulation were studied. Percent feedings was highest in the morning and afternoon session while resting peaked in the noon session. Most activities occurred throughout the day but in different frequency at different parts of the day.

The rhesus macaques are extremely versatile in their food habits. Mostly they consume fruits and leaves (82%) in the spring-summer and leaves and stems (75%) in the autumn-winter. In the study area they depended heavily on a single species i.e. *Mangifera indica* (26.2%), various grass species (Gramineae) including paddy, *Cicer*, maize and bamboo (11.1%), 10.8% legumes and 6.2% plants belonging to Solanaceae including potato, brinjal and tomatoes besides their feed items belong to 24 different plant families. Some authorities reported rhesus to be omnivorous that includes small animals. In this study, however, no such activity was found. The food selection ratio for mango 2.1, papaya 1.85, guava 1.97, black berry 1.80, jackfruit 1.57 and emblic myrobalan 1.52. Altogether food selection ratio was analysed for 17 different plant species. Adult females with infants were found to consume about 125 gms per hour during the feeding bouts followed by adult females without infants, adult males, juveniles and infants. They showed definite preference for *Cynodon* (38.5%) among grasses, *Oryza* (32.2%) among herbs and for Citrus (40.7%) among shrubs.

Social organization among rhesus macaques is complicated due to associations and dissociations of individuals and sub-groups into larger groups and smaller sub-groups. Group sizes varied from 6 to 43 with an average of 9.89 ( $\pm 0.92$ ),  $n = 407$  (during the period February, 1999 to January, 2002). There were male dominated groups 68.1%, female dominated groups 19.8%, pair groups 10% and solitary individuals comprised 2.1%.

Mango orchards occupy about 6.6% land area of the district. Production of mangoes varied from 0.7 million MT to 3.0 million MT in the off and on-season

respectively. The total turn over in mango trade is over 80 crores on average and not less than 33% people of the district are directly or indirectly involved in mango trade in the mango season. Mango cultivation areas are on the increase in recent years because of Government efforts. English Bajar block alone contributed more than 35% land under mango cultivation in the district. Several varieties of mangoes are produced in the district of which Laxmanbhog (12.1%), Langra (11.8%), Himsagar (6.6%) and Amrapali (5.1%) are famous for their taste and aroma throughout India. The mango orchards are of different sizes such as small (upto 2 hectares) 94.6%, moderate (2 hectares to 4 hectares) 4.3%, large (4 hectares to 6 hectares) 0.4% and very large (above 6 hectares) 0.7%. The total damage caused by monkeys is estimated to be around 20% of the total produce.

It is established that monkeys render a lot of damage to the crops including mangoes. Besides they transmit a host of pathogens to humans through their attacks and bites on them. Some of the diseases are deadly. It has also been observed that they select their victims using their knowledge on human limitations and vulnerabilities. Thus children, women, solitary people, people in dirty cloths are their common victims. However, we human beings are not without faults. Actually in recent past we have destroyed their natural habitats as a result the monkeys started invading human ecosystems beginning the episode of man-monkey conflict.