

How Social are Asian Elephants *Elephas maximus* ?

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Abstract: The aspect of social organisation is highly developed in elephants and they display a number of usual and unusual behaviours. In this article, some observations from the protected habitats of north-west India studied during 2000-2009, describing elephant's behaviour that reveals signs of sociality and understanding among the Asian elephants are assessed. Study demonstrates that an elephant is well capable to understand the physical proficiency, emotional state and intention of other fellows. Elephants also feel grief and mourn when anyone of their fellow dies. In contrast, most of the wild animals show least interest in skull of their fellows but Asian elephant (*Elephas maximus*) are very receptive towards their relatives and they approaches the skull of died fellow several times and observing them by smelling and touching with their trunk and fore feet. Sometimes they also uplift and carry the small pieces of bones to a very short distance. Besides, elephant produces several effects on the habitat, which play an important role in dynamics of forest ecosystem and in maintaining their relations with other wild animals [New York Science Journal. 2010;3(1):27-31]. (ISSN: 1554-0200).

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Social organisation is highly developed in elephants. A group of elephants is in general called herd, which is a large family unit. These herds move separately and maintain their relations in terms of acoustic communications and through mixing of different groups from time to time. Previous studies on elephant behaviour revealed that on several occasions especially when long-term migration and elephants' movement was nearer to human habitation areas several smaller groups may join to make a large herd, but this large group formation was restricted to the herds of same kind ship. Social factors such as home range, average group size and seasonality of breeding have a profound influence on the population dynamics of many large mammals and are also important in their management.

During the study period inter-mixing of groups was mostly observed during their long-term migration specially when elephants inter-change the forests through internal corridors. When one elephant approaches another, the trunk was generally extended forward towards the animal being approached. Initial contact between two animals generally involves mutual examination by both animals; the trunk tip was extended towards the other individual, the most frequent parts of contact being the ear, mouth, eyes, temporal gland point, tail, anus, feet and genitalia (Mc Kay, 1973).

The oldest female elephant usually leads the herd however, this was a disputable point whether bull form the part of the herd or not. Bulls are observed to live in groups for a short period of time and during this period they randomly leave and join the groups. During the course of musth in males their movement was enhanced

and they covered longer distances as group movement was restricted to shorter ranges. When a group was on move, they form a formation in such a way that young ones are protected in all manners. Usually, the oldest cow elephant (leader) heads the group, the bull move on the periphery while the young ones are kept inside. Some bulls live a truly solitary life, sometimes accompanied by a companion who may be of around equal age. Generally solitary bulls are branded as rogues though many of them may be inoffensive quite and peace loving. The extensive generation overlap leads to the establishment of linear dominance hierarchy among the females, and the leadership often falls on the oldest female in the group (Santiapillai and Suprahman, 1986). The mixing and separating of the different groups was another factor, which shows their social organisation.

The most cohesive social organisation in elephants was that of the adult female and her offspring, which constitutes a family unit. A number of family units join to form a clan and such clans consist of closely related animals of all classes excluding the adult males. Lactating cows with attendant young may aggregate together to form nursery units. Young pubertal males also mix with the herd to form loose associations for their reproductive activity. Since, the elephant calf is vulnerable to predation, therefore, the social organisation of the matriarchal groups serves as a protective device and at the same time, creates a social behaviour within which the young can mature and learn the template of their environment. It is therefore inevitable that an animal, which remains a member of a family unit for over 20 years, should develop strong social ties with its mother and siblings (Eisenberg,

1981).

There is no parallel to the memory and intelligence of the elephants in the animal kingdom. Since time immemorial many stories and incidents happens, which reflects the strong memory and high intelligence of this largest terrestrial animal. They also follow a fixed pattern for their various activities as other wildlife do. Elephants trumped loudly whenever they are excited or aggressive. Trumpeting occurs when elephant attack, when they are surprised and when an individual has gone the wrong way and feels that it has lost contact with the herd (Oberoi, 1980). Generally groups of elephants produce these rumbling sounds, indicating that it was used in maintaining group cohesion or as a greeting sound when elephants approach each other. Most of this type of trumpeting was observed in the study areas especially in the early morning hours when they are in cheerful mood (mostly by solitary bulls), when group was feeding, if they feel any threat and when their any fellow dies.

Elephants by producing loud noise call their other fellows. Cow elephants call their young ones by slapping their ears against the head and when companions meet, they softly peep and rumble. When they feel threatened, they often upraise their tail, stop flapping ears, beat their trunks against the ground; spread mud and produce a sound like that of a tiger and that was only the moment when they are completely ready to charge anyone.

Few of the investigations indicating rather good vision are supported by the ability of elephants to recognize objects they have seen even after a long lapse of time. Few of the workers also observed that the members of the herd of wild elephants numbering 50 to 100 individuals recognized each other individually. They also know their exact paths, even though many of these paths are used only every few months (Oberoi, 1980). During the study period it was observed that when they move outside from the protected area regarding to crop raiding and crossing the forests through human habitation, they follow a fixed route and sometimes that route even may be longer than other shorter routes by about 2-3 kilometers but they only re-enter to the forest area from the route they have been using. It was also observed that during the course of inter-mixing and intra-mixing between various groups, elephants trumpet loudly and produces several types of greetings and recognition sounds. Vocalization among elephants can also be noted during the pre-mating processes, when some bull elephants are associated with the group and represents their dominance and this process continues for a month or two.

There are many observations on elephants' attempting to help injured companions, supporting them and even attempt to hold up their dead one among their group. When their any group member is injured, the

entire group member attempts by lifting up their injured comrade and by helping in various other ways. In one such case in Chilla forest, a hind leg of an adult cow got injured and swelled and she moved very slowly along with friction. The most wonderful thing I observed was that about 20 elephants including calves were present there and helped her in various manners like helping her in reaching the water source and other activities like feeding. Elephants support her with the help of their trunk by pushing her and lifting her injured hind leg.

A cow giving birth was often surrounded by other cows and was protected by them (Figure 1). Once I saw another such type of co-operative behave among them. When cow gives birth, all the group members take responsibility for caring of the young one. Another interesting thing was that the mother elephant do not leave the newly born calf even she may not charge any one. For few months, I kept under my observation a cow elephant that was debilitated because of an injured trunk. The trunk although was cut partially but was still hanging from its base. There I saw that her fellow elephants helped her in many ways, especially in feeding. This show, how sympathetic, helpful as well as cooperative elephants are. During the course of study sympathetic and co-operational behaviour was quite frequently and conspicuously observed among the elephants. There are many observations of elephants attempting to help injured companions and supporting them.

Mourning Behaviour

Elephants also feel grief and mourn when anyone of their fellow dies. This behavioural aspect is one of the major point, which shows their cooperativeness. Once during study period I observed them in this very grievous, unique, woeful behavioural aspect, which I had never seen earlier. It was a train accidental death of a male juvenile elephant. When I reached the spot I saw that three cow elephant were crying and roaming continuously around 50 meter from injured fellow. When elephants saw us (a forest guard accompanying me), trumped loudly and suddenly five other elephants came there from nearby forest and constituted a group. All of the elephants were roaming continuously till evening. They remained there without feeding for eighteen hours and did not let anybody reach near died one.

In 2001, a calf was pushed over by a train and was seriously injured. The calf's mother was continuously roaming and roaring around her baby and remained with it for one day and did not let anybody reaching near her calf. When officials with the help of tranquillizing gun and domesticated elephant tried to uplift her calf for treatment, the cow made it difficult to carry out rescue operation, as cow continuously charged the object which came nearer to her calf whether that was

domesticated elephant or motor van of the wildlife specialists, which were trying to tranquillize her. She was continuously crying with tears in eyes and trumpeting loudly and was really in big trouble, as her efforts cannot do anything in saving her baby. At that time, tranquillizing gun (which was used for making the cow unconscious) and domesticated elephant were totally ineffective to control the behaviour and movement of the cow. In general, she with her injured baby was facing about 50-60 persons watching towards both of them and it was a different type of elephant-human interaction. After 24 hours (next day), when cow elephant sensed that her calf had died, she finally sorrowfully left her baby nearer to the people and went towards forest area with huge of the tears in her eyes.

while crossing a trench felled down into it. It was quite in trouble and all efforts went in vain to come out of the trench. The fellow elephants moving along with this elephant came for its rescue and tried their level best to take it out, but without success. The elephants remained with it for three days and did not let anybody reach near her. When the local people informed the forest department, officials came, and inspected the situation. But elephants standing nearby made it difficult to carry out rescue operation. When elephants sensed that they have come to help out their companion, they left the spot and stood about 100 meter away, watching foresters taking out the poor creature. When the elephant finally, was taken out, each and every individual, fellow elephant came to it and greeted her (Oberoi, 1980).



Figure 1. A group of elephant near to skull of their died fellow at Chilla forest of the Rajaji National Park.



Figure 3. Broken skull of an elephant witnessing the movement of elephants coming there to mourn around the skull.



Figure 2. Activities of two adult cows near to skull of an elephant.



Figure 4. Skull of an elephant at Chilla forest.

In another such case in West Bengal, an elephant

It was said that one can not see the huge carcass of any died elephant inside the forest specially those die

naturally. During my long term observations I never saw any carcass or skeleton of any died elephant and I made my observations on the same aspect. And after a long period of time I reached to a conclusion that mourning behaviour is very common in Asian elephants. Once (July 15, 2008) an adult male elephant was died at Shyampur forest of the Hardwar forest division and due to heavy rains and delay in postmortem his body could not buried under the ground and the elephant was left as such inside the forest. At the same time I kept myself at a safe place and started my observation for whole night. I thought that this can provide me a chance to reach to a firm conclusion. It was really surprising that four adult bull elephants came to the dead body of elephant about 4 am, early morning and surrounded the victim elephant. One of the elephant started to knock down the twigs of *Tectona grandis* (Sagaun) and *Haplophragma adenophylla* (KutSagaun), which surrounded died elephant. After one and half hour the elephants returned back towards forest. Next day the dead body of the elephant was buried inside the soil, and I regularly encountered the footprints of the elephants near that spot for more than a month.

During 2008 (February) a sub adult male elephant died in bull fight and the dead body of the elephant was buried inside the soil. Elephants were observed sometimes near the spot (Figure 2) especially when their movement was towards Ganges and this only happened up to the month of June because after that elephant's starts migration towards Lansdowne forest and arrival of winters is the time for their returns to the Chilla forest. Meanwhile I continued my observations and came across to the observation that just after one year (during February 2009) some part of the skull emerged out over ground surface mainly because of rains during monsoon and the activities of scavengers. During March 2009 elephants were again observed near to skull and mourning behaviour was observed among them (Figure 3). On 26th of March 2009, an adult tusker died in bull fight at Chilla forest and the body was shifted inside the forest (adjoining to torrential river) by forest officials. The place is now witnessing the movement of elephants coming there to mourn around the skull. For hours elephants have been seen at the site and letting out some mournful sounds. I kept the skull under observation for more than a month until that was broken down into skull (Figure 4).

Elephants' well-documented interest in the carcasses and bones of dead conspecifics might be viewed as evidence of their empathic nature, although the biological functions of these behaviours are yet to be determined (Douglas-Hamilton et al., 2006; McComb et al., 2006). The elephants approached the skull and began examining them by smelling and touching individual objects with their trunks and fore feet and more rarely placing their feet lightly against particular

objects. Sometimes elephants also uplifted and carry the small pieces of bones to a very short distance. Elephant may not specifically select the skulls of their own relatives for investigation, but their strong interest in the ivory and skulls of their own species means that they would be highly likely to visit the bones of relatives who die within their own home range. This is the most likely explanation for why elephants have sometimes been observed interacting with the bones of particular family members, although it remains possible that where ivory is present alongside skulls, elephants may, through tactile or olfactory cues, recognize tusks from individuals that they have been familiar with in life (McComb et al., 2006).

Play and Associational Behaviour

Play behaviour was also observed on several occasions among the elephant groups. This behavioural aspect was most frequent during evening hours and especially during dry periods. The calves within the group are usually more playful than adults. When juvenile elephants are in water point they start splashing dry mud and water here and there. Sometimes they also run suddenly to few feet and quickly come back to their mothers. A group when resting under tree during hot period, they play with each other by entangling their trunks. They were also seen pushing each other with their trunks. Another interesting aspect in the study of their play behaviour is that they were seen sliding down the muddy slopes with their front legs bent back. In such a case the adult cow elephant were seen guarding the movement of their calves. They support them by bringing their trunk in their front.

Sometimes adult cows from the groups were also included in the activity. Once during the study period a cow was encountered who was playing with three calves of a group. All the three calves were playing with each other through entangling their trunk and through pushing back each other and at that time cow elephant was looking after their playing activities and regularly separated young ones at an interval of every two minutes. This type of playing behaviour was generally encountered nearer to the water stream and in evening hours. Play behaviour among elephants mostly occurred within the calves of the herd. The adults would kick the infant, often sending him sprawling onto the ground. When the mother is feeding on grass, at least, quite often the infants are allowed to take food from the handful that the mother has collected in playful manner (McKay, 1973).

The elephant produces several effects on the habitat, which besides affecting the plant communities themselves can affect other animals leaving in the same area. The food left by the elephant becomes fodder for other animals too, which associates elephants and animals such as *Axis axis* (spotted deer) and *Cervus*

unicolor (sambhar). Co-movements of herbivores and elephants were also observed during the study period. Elephants some times break the twigs of the trees like *Ficus bangalensis*, *Ficus glomerata*, *Bombax ceiba*, *Terminalia tomentosa*, *Syzygium cumini*, *Bauhinia variegata*, *Zizyphus mauritiana* and *Embelica officinalis* as part of their habit (Joshi, 2008; Joshi and Joshi, 2007). The leafy portion of the twigs was consumed by ungulates. Elephants were also seen digging holes in dry riverbeds mostly during the dry season to uplift the fresh water for drinking needs. Besides, the fact that elephant do not prefer to drink impure water and for that they dig out the water from sandy area of river beds. These small water points are further utilized by spotted deer, sambhar, mongoose, jungle fox, jackal, wild boar and birds.

Terrestrial mammals such as tiger, leopard, spotted deer, sambhar, wild boar and barking deer besides the human beings regularly use trails, which were used and maintained primarily by elephants. In general an elephant when feeding on a tree or shrub does not tear down the entire plant; rather it tends to remove small twigs and for certain species entire branches. They sometimes fell down entire part of the plant to feed on (*Dendrocalamus strictus*) and sometimes also push and twist the trees full of leaves, but are out of their range, apparently to bring to their reach. Elephants have poorly developed digestive system and therefore, raw material was removed along with dung piles, which was sometimes used by jungle fowl, peacock and termites. Another important point is that elephant play a major role in dispersal of seeds of large trees like *Dalbergia sissoo*, *Shyzygium cumini* and *Ficus glomerata* through defecating them in different parts of the forest. Elephants having association with other wild animal's benefits both of them, the elephant itself and the other animal in various ways like feeding and drinking (McKay, 1973).

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