

## The Pride of Assam : A Review on the Behavioural Aspects of Great Indian Rhinoceros

Sangita Medhi

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**Abstract :** The traces of great Indian rhinoceros is dated back from 900BC in the Chandogya upanishad. It was present in many places of India along the Indo-Ganges and Brahmaputra belt. However, it is now restricted to only few pockets. Passion of hunting by the royal families and poaching are the main reason of its decline. Hence, proper conservation has become an important aspects to save the remnant number of species. Rhinoceros acts as an umbrella species and other organisms are also conserved along with it. Ecological studies are the vital part of conservation and very few works has been done. This review is an attempt to aggregate various research work of Indian rhinoceros done on the globe.

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### Introduction

The description of *Rhinoceros unicornis* is dated back from the time of Harappa and Mohenjo-Daro. Lang, (1961) have mentioned about the presence of Indian rhinoceros in the 4000 years old craved seals of Harappa and Mohenjo-Daro. Moreover, traces of Indian rhinoceros were also found in the Chandogya upanishad of 900 BC (Rao, 1957). As the survivor of Pleistocene period, rhinos are often regarded as living fossil (Patar, 2005). It was named as Indian- Ass by Ctesias, the physicist of a Persia Queen, Parysatis and mentioned the horn as a poison neutralizing cup (Casal, 1933; Prater, 1971; Hoogewerf, 1970; Van Strien, 1974). Indian rhinoceros (*Rhinoceros unicornis* Linn., 1758) were found in Europe during the 16th century but the scientific description of was first documented by Person in 1743 (Clarke, 1973). The facts and figures about Indian rhinoceros prior to Person was found only in historical records, religious literature and hunters and travelers' tales etc. (Laurie, 1978). Akbar the Mughal Emperor (1542-1605) have recorded the existence of rhinoceros near Shambal in Utter Pradesh (Jarret, 1949). Miniature paintings and objects resembling rhinoceros were found to be made in India between 1500-1650. A famous miniature painting of hunting rhinoceros by Emperor Jahangir was made through Circa in 1600 which is evident to the above statement (Sinha *et al*, 2011). All the three Asian rhinoceros has been reported to inhabit in Indian Sub-continent, but only Indian rhinoceros is now left (Dey, 1999; Menon, 1996). Pollok & Thorn in 18th century mentioned that Indian rhinoceros was tamed and trained in the ancient Assam and used for ploughing, in wars and also to carry the laundry (Laurie, 1978; Guggisberg, 1966). Butler (1847) had mentioned that the tamed rhinos grazed with the domestic cattle and were sold also. It was also used in Zoos (Lang, 1961) and circuses (Reynolds, 1967). Hunting was a passion of the royal families in today's India. The Moghal emperor's viz., Babur (Lamb, 1964), Jahangir (Ali, 1927) and King of Coach Bihar (Smythies, 1942 & Prasad, 1975) were fanatical hunters of wild animals including rhinoceros. Due to the mass decrease of Indian

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*Ph.D. Scholar, Animal Ecology and Wildlife Biology Laboratory, Department of Zoology, Gauhati University, Guwahati, Assam, India*



rhinoceros population it was categorized under near extinction in the early 20th century (Foose, 2002).

### **Behaviour and Ecology :**

The earlier study on Indian rhinoceros were limited to captivity. The first captive birth of the animal was recorded in Kathmandu in the year 1826 (Hodgon, 1834) while, the next was in Calcutta in 1925 (Gee, 1953). Captive breeding was also successful in European zoo's since 1956 (Lang, 1961; Lang *et al.*, 1977). Many researcher have studied on the reproductive and maternal behaviour of rhinoceros in captivity after the successful breeding in Europe (Lang *et al.*, 1977; Buechner & Mackler, 1975). Prater (1948), had documented the morphological structure of Indian rhinoceros and stated its appearance as a monster. While, Cave (1964) have studied about the anatomical aspects of Indian rhinoceros elaborately. However, Owen's (1992) study on the anatomy was regarded as the most complete work of that time. Berg (1933), a Swedish photographer have studied Indian rhinoceros in the wild. He studied on the movement pattern and feeding habits in Jaldhpara Wildlife Sanctuary, West Bengal. Gee (1953), have conducted some observation on the ecology and behaviour of Indian rhinos in Assam and Nepal. He documented on the territorial behaviour, agonistic behaviour and mating behaviour. Ullrich (1964) focused on its social behaviour in Kaziranga National Park. Ripley (1952) have studied on the territorial and sexual behaviour of Indian rhinoceros and mentioned that the gestation period of rhino is 19 months and lactation takes place up to 6 months. However, Kakati & Rajkhonwar (1972) have stated it as 16 months with 28 months of inter calving period. Lahan & Sonowal (1972) and Lahan (1974) gave an account of the aggressive behaviour and stated that they show aggression to maintain territory and during mate selection. The most extensive work on the ecology of Indian rhinoceros was done by Laurie (1978) in Chitwan National Park. He gave an account on the feeding ecology and behavioural pattern of Rhinos. He mentioned that the grass species constitute 70-89% of the rhino diet. He also studied on the distribution of Indian rhinoceros. He mentioned about the social behaviour and stated that Indian rhinoceros are solitary animal but shows association during wallowing and between mother and calf. Moreover, he mentioned 10 olfactory sounds produced by rhinos in different situations. Dinerstein & Wemmer (1988), studied the seed dispersal in Indian rhinoceros. Dutta & Battacharya (1989), have mentioned about the grazing pattern of Indian rhinos. While Ghose (1991), studied some ecological aspects in Jaldapara Wildlife Sanctuary. Dutta (1991), observed the behaviour of Indian rhinoceros and mentioned that its activity is restricted to "eat, sleep and wallow". Blanford (1991) and Dinerstein & Price (1991), have studied on the sexual dimorphism, demography and habitat use of Indian rhinoceros in Nepal. Yadav (2000), have studied on the agonistic behaviour of Indian rhinoceros. He documented that adult males shows aggressiveness to other male in his territory, especially during association with female in mating period. Kushwaha *et al.*, (2000) have analyzed the habitat of Kaziranga National Park and reported that only 27% of the park area is unsuitable for the rhinos and suggested proper management. Moreover, Banerjee *et al.*, (2001), investigated habitat use by rhinoceros and other sympatric herbivores. Bairagee *et al.*, (2004), documented on the utilization of rhino habitat by the people of fringe village in Pabitara Wildlife Sanctuary.

Patar (2005), had done few observation on the habitat of Kaziranga National Park and behaviour of Indian rhinoceros. He gave an account of the increasing Mimosa, an exotic plant which spread along the grassland and suggested to remove it manually and mechanically. He argued that Kaziranga National Park consists a favorable habitat for the rhinos because of the



presence of grasses, forbs and shrubs in all the habitat types and develops maximum suitable edges. He had also documented on the territorial and social behaviour, movement pattern, communication marks, inter-specific interaction etc. The author found that the dominating bull shows territoriality to other males but females were found to use their territory. However, he also explained that the home range depends and changes with the food and water availability. He have mentioned that the association of female-calf with buffalos in the grazing grounds acts as a second line of defense against the tiger. Kafley *et al.*, (2009) evaluated the habitat of Indian rhinoceros in the Chitwan National Park. Hazarika & Saikia (2010, 2011, 2012) and Hazarika *et al.* (2013), have catalogued the breeding and non-breeding behaviours of Indian rhinoceros. They studied the habitat utilization pattern in Orang National Park. They have also documented on the food preference and the feeding pattern of Indian rhinoceros. Bhatta (2011), have studied on the habitat utilization pattern, habitat suitability and population demography of Indian rhinoceros in Pobitora Wildlife Sanctuary. He mentioned that 54.8% of the park area is covered by grassland. He found that 44.77 sq. km. area unsuitable for rhinos and that the park is facing a serious anthropogenic pressure. He reported a mean home range of 17.15sq.km. of rhinos in the sanctuary and stated that the sanctuary has reached the carrying capacity which is leading to increase in rhino stray. Studies have also been carried out on the translocated Indian rhinoceros by Dutta & Mahanta (2016, 2018). They documented on the post released translocated Indian Rhinoceros in Manas National Park. Rhinos are typically a solitary animal but shows social behavior during breeding period. All rhinoceros species are polygamous and polyandrous (Owen-Smith, 2004).

#### **Spatial Distance between Mother-calf :**

Successful rearing of infants has a wide range of mothering styles in different species (Bettelheim, 1988). The bond of cow-calf has been reported to be strong by some researcher (Spinage, 1968; Guggisberg, 1966) while it is described as weak by others (Innis, 1958; Foster, 1966; Foster & Dagg, 1972). Buechner & Mackler (1975) studied on the mother-calf relationship. Studies on maternal care of *Rhinoceros unicornis* was done in both captive (Mackler & Buechner, 1978) and wild condition (Laurie, 1978). Immediately after parturition the cow starts to smell and nuzzle the calf (Estes, 1972). The cow have also reported to exhibit flehmen during the post partum period (Schneider, 1930). The mothers frequently shows contact-behaviour towards the calf. Nose to nose, nuzzling, open mouth biting, chin to back contact are few contact behavior seen between cow-calf (Mackler & Buechner, 1978). First lactation by the calf was reported to be after 3 hours and 35 minutes after birth (Mackler & Buechner, 1978). Weaning in Indian rhinoceros occurs in 16 months in the wild (Laurie, 1974). Several studies reveals that the cows are more responsible for calf weaning by rejecting them (Jensen *et al.*, 1967; Rosenblum, 1968; Struhsaker, 1971; Hind & White, 1974; Berman, 1980). Nursing of adopted calf by some female is also reported in the wild (Dinerstein *et al.*, 1988) which are otherwise killed by dominating males (Laurie, 1978). Many studies on mother-calf relationship has been carried out in other ungulates like Giraffe (Langman, 1977), Black rhinos (Greene, 2006), Dolphin (Taber, 1982). Black Rhinoceros are known to keep their calves close to them both in captivity and wild (Penny, 1987). Mother-calf relationship has widely studied in primates (Jensen *et al.*, 1967; Altmann, 2001; Nash, 1978; Hind & White, 1974; Struhsaker, 1971). Laurie (1978), have also mentioned about maternal care of Indian rhinoceros in his studies.

#### **Population :**

Distribution and range of greater one horned rhinoceros were also mentioned by some writers on their literatures in India (Rao, 1957; Prater, 1971; Rookmaaker, 1980, 1982, 1984; Dutta, 1991;



Owen-Smith, N., 2004). Fecundity and mortality of rhinoceros were given on their articles by Lang *et al.* (1977), Talukdar (2002) and Pluhdcek *et al.* (2007). Diseases cause by helminthes infection, gastrointestinal infection and foot disease were also studied by Bordoloi *et al.* (1990), Chakraborty & Islam (1993). The status and distribution of Indian rhino in India, Pakistan and Nepal was done by Manner (1909), Stracey (1957), Gee (1959, 1963), Rookmaaker (1980, 1982), Choudhury (1985, 1996a, 1996b) and Bist, (1994). Lwin, (1998) reported the past distribution of Indian rhino in Mynmar. Choudhury, (1985, 1986, 1989, 1994, 1997a, 1997b) presented the distribution of Indian rhinos and grassland habitat in and outside protected areas and about the historic presence of Sumatran rhino in Northeast India. Rookmaaker (2002) described the historical records of Indian rhinos in Northern India and Pakistan. Hussein (2001) described the status of Indian rhinos in Orang National Park.

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