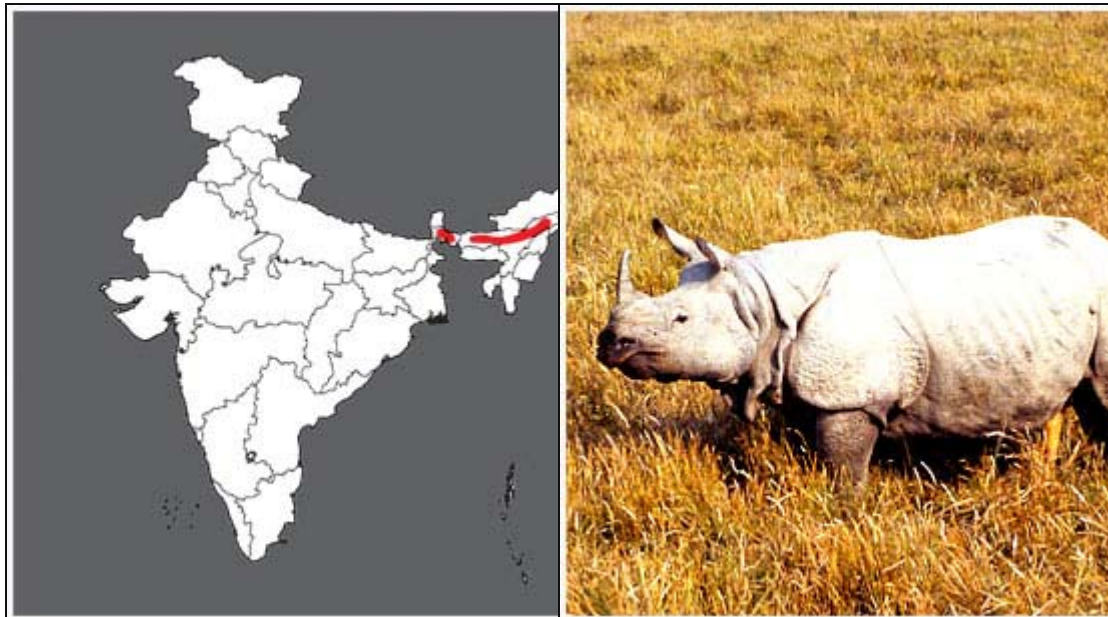


The Great Indian One-Horned Rhinoceros

(*Rhinoceros unicornis* Linnaus, 1758)

S.P. Sinha



Order :	Perisodactyla
Family :	Rhinocerotidae
Sub-Family :	Ruminantia
Genus :	Rhinoceros
Species :	R. unicornis
Common name :	Genda or Gaiinda

Conservation Status	
WPA (1972) :	Schedule I
IUCN RED DATA BOOK :	Endangered
Cites :	Appendix I

1. Introduction

The Great Indian one-horned Rhinoceros (*Rhinoceros unicornis*) is perhaps the most endangered species of Indian mega fauna and one of the five remaining species of rhinoceros of an approximately 30 genera that once roamed the world. Rhinoceroses first appeared in the late Eocene period. The oldest Indian rhinoceros like species was *Brontops robustus*, but the genus *Rhinoceros* may be traced back to the Pliocene period in northern India, and fossilized remains show that these animals were dwellers of riversides and marshes. In India, the rhinoceros has an old and traditional-linked history. The representation of the rhinoceros ichnographically or its mention in written accounts has been reviewed by a number of authors including, Ali (1927), Ettinghausen (1950), Rao (1957) and Rookmaaker (1982). Although most of these quote were sixteenth and seventeenth century accounts by medieval authors and other second hand information, the accounts by Al Beruni and Ibn Batuta, the two historians and scholars of the same period, are among the more authentic ones. Akbar the third Mughal emperor of India (1542-1605), records the existence of rhinoceros near Sambhal in Uttar Pradesh (Jarrat 1949). Another Mughal emperor, Jahangir, records them in his memoirs as inhabiting Aligarh in Uttar Pradesh. The historical records of distribution of rhinoceros in India and Pakistan are given below:

Historical records of rhinoceros distribution in India and Pakistan

Country	Site	Era	Reported by
India	Ganganagar, Raj.	3500-400BC	Banerjee and Chakravorty (1973)
India	Langhnaj, Guj.	Pre-Pottery	Zuener (1952)
India	Lake Kanevel, Guj.	8000-1200 BC	Momin et al. (1973)
India	Siwalik Hills	Miocene-Lower	Baker and Durand (1836), Falconer and Cautely (1847), Falconer (1868), Lydekker (1876).
India	Mirzapur, UP	Not Known	Cockburn (1883)
	Banda UP	Not Known	Cockburn (1883)
India	Chirand, Bihar	c.1700 BC	Nath (1976)
India	Madras, Tamil Nadu	Not known	Lydekker (1880)
India	Gokak, Belgaum, Kar	Not known	Foote (1874)
Pakistan	Harappa	2500-1500 BC	Prashad 1936
Pakistan	Mohenjo Daro c.	300 BC	Marshall 1931

A large number of miniature paintings and other objects depicting rhinoceroses were made in India between 1500 and 1650 and a famous miniature painting of circa 1600, showed Emperor Jahangir hunting rhinoceroses. Although animals are easily recognizable as greater one-horned rhinoceros, all three Asian rhinoceros once inhabited the Indian subcontinent. The Javan and Sumatran rhinoceros (*Rhinoceros sondaicus* and *Diceros sumatrensis*) become extinct in India in the early part of this century and the greater one-horned rhinoceros is the only rhinoceros species left in the wild in the country (Menon 1996). The Indian rhino averages 170-180 cm (5 ft 10 inch to 6 feet) at the shoulders with a girth of 335 cm (11 ft) behind the withers and weigh around 2 tons. The great Indian rhino has a single horn which is 35 – 40 cm in length. A record specimen exhibited in the British Museum had a length of almost 62 cm and a base circumference of almost same. The horn of the rhino is not a true horn because it does not have a core of bone. The compact mass of keratin fibers not fixed to the skull and rest epidermally on a bony cushion. There are numerous instances of rhinos losing their horns and being replaced by new one. The average weight of an Indian rhino horn is around 750 gms. In international markets of far east the price of

one kilogram of powered horn cost around 40,000 US dollar. Such high price lures and proves to be the strongest incentive for poaching (Dutta 1996). The growth pattern of rhino horn at different age classes is given below:

Growth pattern of horn in Indian one horned rhinoceros

Age	Size
At birth	No protuberance
6 months	1.1 – 1.65 cm
1 Year	3.3 – 5.5 cm
2 Year	6.6 – 8.8 cm, basal circumference 17.6 – 22 cm
3 Year	8.8 – 13.2 cm, basal circumference 17.6 – 44 cm
3-20 Year	19.8 – 22 cm, fully matured horn
25 – 30 Years	Reduction in height due to wear and tear

The skin of this massive creature is divided in to great shields by heavy folds before and behind the shoulders and in front of the thighs. The fold in front of the shoulders not continued right across the back, a distinctive character of this rhinoceros. On the flanks, shoulders, and hindquarters, the skin is studded with masses of rounded tubercles. With its grotesque build, long boat-shaped head, its folds of armour, and its tuberculated hide, the animal looks like a monster of some bygone age (Prater 1948).

Identifying a male and female rhinoceros in the wilderness is difficult when the animal is found in the tall grasslands. But in open areas if carefully observed on the basis of genital organs, collar folds and shape of the head, one can distinguish between male and female. In case of males, collar folds and head is massive as compared to female rhinos. In females, the skull is slightly thinner, the base of the horn is narrower and the horn is slimmer. However for sub adult rhino and calf such determination is impossible without physical examination (Dutta 1996).

GEOGRAPHICAL AND ECOLOGICAL DISTRIBUTION

Historically, the range of the great Indian one-horned rhinoceros once extended all along the flood plains of the river Indus, Ganges and Brahmaputra. Babur – nama has recorded the presence of the rhino in Hindukush to the west to the present Indo-Myanmar border to the east. The causes of decline of the rhino population in the past were due to destruction and fragmentation of rhino habitat primarily for extension of agriculture and tea gardens, poaching of rhino for horns and other parts attributed to have magical medicinal value, hunting of rhino for sports during Mughal period and early days of British rule in India, and later during the regimes of the Maharajas, in the last 400 years wiped out the rhinos from most of its range of distribution except in pockets left in north-east in the states of Assam and West Bengal along with Nepal where such vestiges of terai constitute the last strong hold for rhinos.

POPULATION

Currently, around 2500 rhinos exist in the wild of which over 1500 are in Kaziranga NP and over 500 in the Royal Chitwan NP, Nepal. The rest are found in small insecure pockets in Orang WLS, Pabitora WLS, Assam and Jaldapara WLS, Gorumara NP, West Bengal. The rhino population in Laokhowa Wildlife Sanctuary was totally wiped out during 1983 when 40 rhinos were killed by poachers during

the Assam agitation. In addition to these wild rhino were reintroduced in Dudhwa NP, Uttar Pradesh, India and in Royal Bardia NP, Royal Suklaphanta Wildlife Reserve, Nepal.

ECOLOGY

The one-horned rhinoceros is largely a grazer. They are associated with the water bodies for feeding, wallowing and resting. Mating takes

Current status of Indian one-horned rhinoceros in India and Nepal (2004)

Migratory Population		
Katarniaghat WLS, India – 4 rhino		
Natural Population		
Name of the Area	Number of Rhino	Total Area
Kaziranga NP, Assam	1600 +	430 km ²
Royal Chitwan NP, Nepal	600 +	932 km ²
Pobitara WLS, Assam	78	16 km ²
Jaldapara WLS, West Bengal	65	21 km ²
Orang WLS, Assam	46	78 km ²
Gorumara NP, West Bengal	32	8.88 km ²
Manas NP	Doubtful existence	-
Laokhowa WLS	No rhino left	-
Reintroduced Population		
Name of the area	Rhino Population	
Dudhwa NP/ TR, India	21	
Royal Bardia NP, Nepal	85	
Royal Sukhlaphanta WLS, Nepal	6	

place throughout the year and there is no specific calving season. The rhino wallows in lakes, rivers and temporary pools. In Chitwan, Nepal, it wallowed most frequently between June and October (51% of observations). Heat regulation is probably a major function of wallowing, but escape from flies, especially in tall grasslands during the monsoon, may also be important (Laurie 1978). The Indian rhino is the most aquatic rhino, wade and swim with ease and also feed on number of aquatic plants, like Hygrorhyza cristata, Tvoppa spp, Valles naria and Nymph. It has been observed that after burning of grassland, within a week rhino feed on half burned sward of grasses with dry pith and also lick the ash on the ground (Sinha and Sawarkar 1991). Though it prefers swamp and grasslands, they can also be found in wood jungle up ravines and low hills (Prater 1948). The age distribution of Indian rhinos in Chitwan, Nepal was reported as: 27% sub adults, 32% adult females, and 20% adult males and 14% calves, 14% sub adults, and 65% adults (Laurie 1978). The gestation period is between 16 and 18 months and single calf is born during the rainy season (Laurie 1978). Usually mother rhino keeps her calf away from other rhino and is very aggressive. This period is crucial to new born calf as it is vulnerable to predation. The causes of mortality among adult rhinos are due to disease like anthrax, road accidents, over inundation of water and succumbing to injuries caused due to fighting between individuals. Males attain sexual maturity at the age of 7 years and females at 5 years. The longevity or life span of a rhino in the wild is 30-35 years and in captivity 47 years.

BEHAVIOUR

The one horned rhino is largely solitary in nature and the male and female are seen together only during mating season. The one horned rhino is not territorial. The home ranges of dominant bulls overlap with one another, with ranges of weaker males that do not attempt to mate, and with ranges of females. Calf stays with its mother for at least four years. From time to time rhino meet with each other in the common ground like grazing areas and wallow sites and stay together without showing any aggression. It has been observed in Kaziranga NP when 32 rhino were wallowing in a small pool of water and were tolerant to each other (Deb Roy pers. com.).

Mating in rhino is initiated by female which runs around potential breeding male by making loud sound and frequently squirting urine and some time pushes the male. Male rhino chases female rhino for hours till female rhino get exhausted and stays in one place and then mating takes place.

Mother always tries to keep away her calf from the male. The moment mother becomes conscious of presence of male near her calf it chases away the male. Male calf when separated from mother usually makes company with other young male but keeps itself away from dominating male of the area. Communication between rhinos is through audible and ultrasonic sound in varied frequencies. Rhino can identify each other by sniffing the pedal gland secretion left behind on the path ways.

CONSERVATION

Despite of the efforts as provided by the field staff to protect the species, persecution of this animal still continues due to rising price of its horn in the international markets especially in the far - east countries for preparing oriental medicines. In Kaziranga NP from 1983-89, a total of 235 rhinos, were killed by the poachers for horns. New ways of poaching rhinos by electrocution in Kaziranga NP and Pabitora WLS, Assam and using pesticide in Jaldapara WLS in West Bengal were reported (Menon 1996).

Considering their small and isolated population in the existing ranges, it is recommended that reintroduction of the species in suitable habitats in its former range of distribution is the need of the hour. The IUCN Rhino specialist group and Rhino Sub- Committee of the Indian Board of Wildlife (IBWL) recommended the establishment of an additional rhino population in India. The Dudhwa NP fulfilled all the criteria required for the reintroduction among the various sites surveyed in India by a panel of experts. Thus, Dudhwa NP becomes the first and currently the only site of reintroduction of the rhinos in India during 1984-85. Other reintroduced rhino population exist in Royal Bardia NP and Sukhlaphanta WLS in Nepal and reintroduction of rhinos took place between 1986 and 2004. The reintroduction of rhino in Dudhwa NP took place in two phases. The first phase in 1984, in which five rhinos comprising 2 males and 3 females were captured and translocated to Dudhwa from Pabitora WLS, Assam. These animals were released in the Rhino Reintroduction Area (RRA) in a specially constructed stockade for health care and for experiencing fence before final release in to the main fenced area of RRA. In the second phase in 1985, four female rhinos were translocated from The Royal Chitwan NP, Nepal. In 2004, after 20 years of reintroduction in Dudhwa NP, rhino population raised to 18 from a founder population of 5 rhinos (one male and four female) after facing number of set backs (Sinha and Sawarkar 1991, 1992, Sinha et al. 2001, Pluháèek and Sinha 2002).

In Nepal, in 1986, a total of 13 animals (5 males and 8 females) were captured from Suaraha area of Royal Chitwan NP and successfully released in the alluvial flood plain of the Karnali River in The Royal Bardia NP. Similarly, in 1991 another batch of 25 animals (8 males and 17 females) were captured from the same area and released into Royal Bardia National Park (Maskey et al. 2001). Later in 1999, four males were released in the RBNP. In the year 2000, a total of 20 animals were captured from Chitwan and released in RBNP and four in Royal Suklaphanta

Wildlife Reserve. In the year 2001, five more rhinos were translocated from Royal Chitwan NP to The Royal Bardia NP (Maskey et al. 2001). The governments of India and Nepal are already providing considerable funds to conserve the rhino and their habitats and have been successful in in-situ conservation. Because of the demographic pressures, to carry this success in to the next millennium, the efforts of the Governments of India and Nepal should be augmented with International funds. Conservation success achieved in India and Nepal in case of the Rhino has been possible due to extraordinary dedication and commitment of the field staff. The service conditions of these field staff who are the guardians of the world's heritage requires to be adequately upgraded in order to commensurate with their selfless struggle. Though it is a mega herbivore, very little research has been conducted on this species. There is a need for further research on this species to study the food habits, home range, habitat use, behaviour etc. to strengthen our knowledge required for better management of rhino habitats.

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