

RESEARCH

Successful rhino conservation continues in West Bengal, India

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Abstract

Gorumara National Park (80 km²) and Jaldapara Wildlife Sanctuary (216.5 km²) are situated in northern West Bengal close to the borders of five countries, including China, where demand for rhino horn, along with Vietnam, has been greatly increasing this decade. Yet since 1990 the rhino populations in these two protected areas have continued to rise, with 43 and 150 rhinos respectively, and poaching of the greater one-horned rhino has been extremely low. The central and State governments of India have continued to allocate large sums of money for their protection, with field staff of nearly two per square kilometre who are committed and well motivated. They are receiving respectable salaries that keep up with inflation; their amenities have improved for patrol work, with more trained elephants and watch towers; and staff now have mobiles, improving security for both rhinos and guards in their remote hardship posts. The second major reason for success has been the continued improving relations of wildlife personnel with local villagers. They work closely together, with rhino awareness programmes, with eco-projects and eco-tourist enterprises that can benefit the villagers, enabling them to reduce their need for forest resources. The fringe villagers understand that by protecting rhinos from poachers, more tourists come and in turn they receive tourist revenue—up to 25%—from the Forest Department. The growing success in anti-poaching efforts, with field staff and villagers supporting one another towards this mutual goal, can be emulated by other rhino range States.

Additional key words: greater one-horned rhino, anti-poaching, Jaldapara, Gorumara, eco-tourism

Résumé

Le Parc National Gorumara (80 km²) et le Sanctuaire de la Faune Sauvage de Jaldapara (216,5 km²) sont situés dans le nord du Bengale occidental à proximité des frontières de cinq pays, dont la Chine, et le Vietnam où la demande pour la corne de rhinocéros a largement augmenté cette décennie. Pourtant, depuis 1990, les populations de rhinocéros dans ces deux aires protégées ont continué à augmenter, avec 43 et 150 rhinocéros respectivement, et le braconnage du grand rhinocéros unicolore était extrêmement faible. Le gouvernement central et les états de l'Inde ont continué à allouer d'importantes sommes d'argent pour assurer leur protection, avec un personnel de terrain de près de 2 écocardes au km² qui sont motivés. Ils reçoivent des salaires respectables qui tiennent le coup à l'inflation; leurs équipements ont été améliorés pour le travail de patrouille, avec davantage d'éléphants domestiqués et de tours de guet, et maintenant le personnel a des portables, ce qui améliore la sécurité à la fois des rhinocéros et des gardes dans leurs postes éloignés difficiles. La deuxième raison majeure pour le succès a été les relations améliorées continues du personnel de la faune sauvage avec les villageois locaux. Ils travaillent en étroite collaboration sur les programmes de sensibilisation sur le rhinocéros, les éco-projets et les entreprises éco-touristiques qui profitent aux villageois, leur permettant ainsi de réduire leurs besoins de ressources forestières. Les villageois qui habitent autour comprennent qu'en protégeant les rhinocéros contre

les braconniers, plus de touristes viennent, et à leur tour ils reçoivent des recettes des touristes, jusqu'à 25%, du Département des Forêts. Le succès croissant dans la lutte contre le braconnage, où le personnel de terrain et les villageois se soutiennent mutuellement pour atteindre cet objectif commun, peut être émulé par d'autres Etats de l'aire de répartition du rhinocéros.

Mots clés: Grand rhinocéros unicorne, lutte anti-braconnage, Jaldapara, Gorumara, éco-tourisme

Introduction

In the last 25 years, and especially since 2008, there has been little rhino poaching in West Bengal. This has also been the case in the neighbouring State of Assam and in Nepal, which borders India. In contrast, rhino poaching in Africa has become acute, with at least 1260 black and white rhinos poached since 2008 in South Africa and Zimbabwe alone, the highest figures for many years (Knight, 2011a,b).

In Nepal, of about 535 rhinos not one was poached in 2011 according to the Department of National Parks and Wildlife Conservation (Talukdar, 2011). In Assam, of about 2400 rhinos only 17 were poached in 2011 according to officials (Talukdar, 2011). In West Bengal the two rhino populations of Gorumara National Park (80 km²) and Jaldapara Wildlife Sanctuary (216.5 km²), which numbered 40 and 150 rhinos respectively in 2011, had no rhinos poached that year, according to the State Forest Department.

This article looks at why rhino poaching is so low in West Bengal in particular, concentrating from 2006 through 2011 as this period has not yet been well documented nor the Forest Department successes acknowledged.

Methods

One of us (EM) had carried out fieldwork on rhino conservation in West Bengal in 1993, 1998 and 2005. It was thus necessary to update this information on West Bengal's rhinos, so in February 2012 we visited Siliguri, the main city in the northern part of the State, and also Gorumara National Park (NP), Jaldapara Wildlife Sanctuary (WLS) and the Forest Department offices in Jalpaiguri and Cooch Behar. In Delhi, we visited TRAFFIC India, the Wildlife Trust of India and the Wildlife Protection Society of India to learn about the rhino situation in West Bengal.

Results

Gorumara National Park

RHINO NUMBERS AND RHINO POACHING

In 1993 a census in Gorumara NP recorded 15 rhinos (Martin, 2006). A census in 2006 recorded 27 rhinos, another in 2010 counted 35 rhinos. A March 2012 census counted 43 rhinos (Figure 1). The last known rhino poached in Gorumara NP was in 1992 (Das and Debnath, 2007; Bimal Debnath, Range Officer, Gorumara NP, pers. comm., March 2012).

HIGH GOVERNMENT BUDGETS

The central government of India continues to provide funds directly to Gorumara NP. In addition the State government provides funds to the Park out of its budget for Wildlife Division (II), which also covers the main offices in Jalpaiguri and the nearby protected areas. Thus, it is not possible to give the precise amount for the Park only, because the official State funds are for the entire Division. However, an acceptable methodology is to estimate the amount allocated to Gorumara NP based on the number of permanent staff employees of the Park (50) in 2011 compared with the total number for Wildlife Division II (137). This methodology was used previously by EM (Martin, 2006) and is considered to be a good approximation, according to Debnath (pers. comm., February 2012), who is the most experienced member of staff in Gorumara NP. Thus, 137 divided by 50 = 36% and therefore the 2010/11 financial year's Park budget was as follows. The Park received from the State government a calculated 15,344,233 rupees (USD 326,473) which is divided into State-Plan, mostly for capital expenditure of a calculated 1,080,000 rupees (USD 22,979), and Non-Plan, mostly for recurrent expenditure such as salaries and electricity, of a calculated 14,264,233 rupees (USD 303,494). The Central government's funds were provided from their Centrally Sponsored Scheme (CSS); these funds go

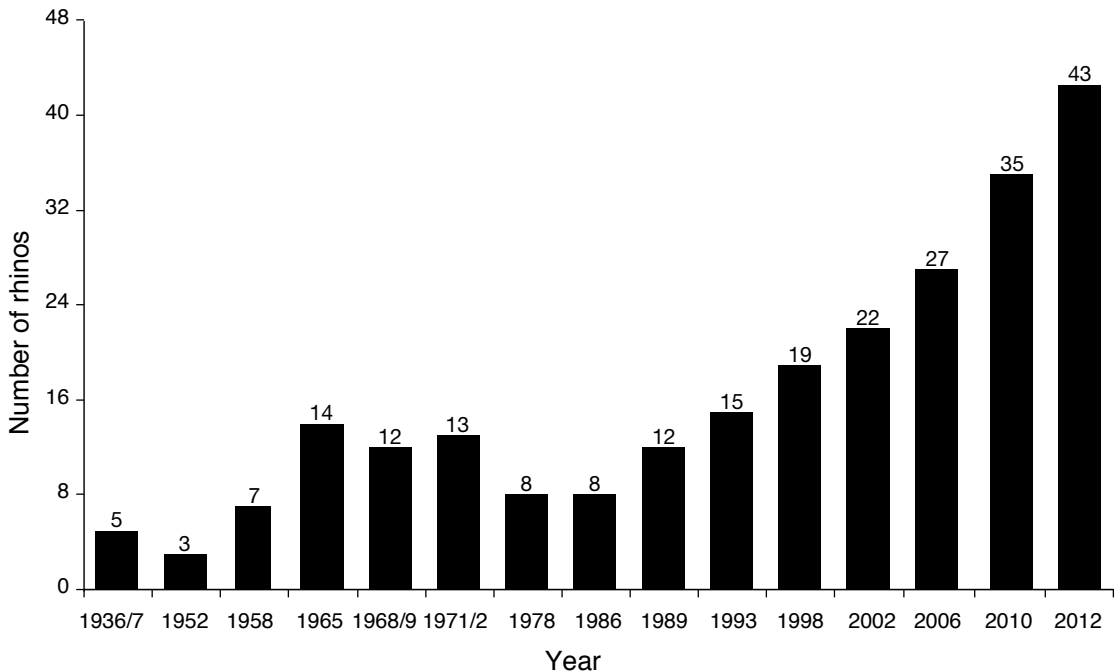


Figure 1. Population of greater one-horned rhinos in Gorumara National Park.

entirely to the Park for habitat management (mostly for rhinos) and amounted to 5,100,000 rupees (USD 108,511) for the period (West Bengal Forest Division, Wildlife Division II, Jalpaiguri, unpublished data). Thus the total budget calculated for the Park for 2010/11 was 20,444,233 rupees or USD 434,984. This has been a rise since the early 2000s of 32% in rupees and 28% in dollars (Martin, 2006), which approximately matches inflation in India.

HIGH NUMBERS AND MOTIVATED PARK STAFF

In 2010/11 funds spent on the Park were approximately USD 5,437 per km² (USD 434,984 divided by 80 km²), one of the highest in the world for a government rhino protected area. This allows the Forest Department to employ for the southern range (where the rhinos mostly inhabit) 31 permanent staff: 1 range officer, 4 beat officers, 2 head forest guards, 11 forest guards, 2 mahouts and 11 forest labourers. Much of their time is in patrol work and motivation for rhino safety. There are also 66 temporary/casual workers: labourers, drivers, assistant mahouts, grass cutters (for the trained elephants), forest protection staff, cooks. In the northern range there are 19 permanent staff and 42 casuals, fewer than in the southern range due to the lower number

of rhinos. Thus the total number of staff in the Park is 158, almost 2 people per km² which continues to enable excellent rhino protection despite increasing demand for rhino horn in eastern Asia. The southern range had 13 domesticated elephants of which 8 were being currently used for patrolling and tourist rides. There were 13 trained elephants in 2006 (Das and Debnath, 2007).

Since 2007, salaries and wages have risen considerably, which has improved the commitment of the staff. In 2007, a beat officer received about 4,838 rupees (USD 114) a month and in 2012 he was receiving 15,000 rupees (USD 306) a month. In 2007 a casual labourer received a minimum of 71.08 rupees a day (USD 1.67) and in 2012 he was receiving 130 rupees (USD 2.66). These salary rises are consistent with other successful professions and has improved the morale of the staff in the Park.

The recent widespread introduction of the mobile phone has enhanced Park management. Now the camp staff have mobiles as well as radios, strengthening the guards' own security as well as efficiency in Park management and rhino protection. The senior staff also encourage junior staff to use their mobiles to contact them directly to report any wrong doings, and

this open transparency helps motivation further. These improvements have also occurred in Jaldapara WLS.

BENEFITS TO LOCAL COMMUNITIES

There is an endless need to assist the very poor villagers living around the Park as their density increases on limited land. Their dependency on the forest puts more poaching pressure on the Park, with the temptation to cooperate with national or international poachers. There are now 900 people/km² on the fringes of the Park. Park staff have thus been gaining the local villagers' trust and cooperation ever increasingly since the 1990s by working with them to improve their livelihoods in a number of ways. Human-wildlife conflict, especially with elephants, is a major problem. The last recorded human death by a rhino was in 2009 when a woman was killed outside the Park. Compensation paid by the government in West Bengal to the family for such a death is presently 100,000 rupees (USD 2,041), up from 30,000 rupees (USD 667) in 2005 and it is soon to be doubled. People injured by wild animals are treated at government hospitals free of charge. If there is damage to huts, livestock and even crops, the government compensates those affected (Debnath pers. comm., and Tarun Mashalanbish, range officer, Gorumara North, February 2012).

The Forest Department has established five ecotourist places for accommodation consisting of 19 cottages employing 70 cottage staff, 108 cultural

dancers, 78 families making souvenirs, 7 families providing buffalo cart rides and miscellaneous others. For example, one site, Gorumara Eco-Village Kalipur that was opened in 2006, has four cottages for 12 guests and employs from the village seven cottage staff, four dancers, six buffalo ride cart drivers, and four boatmen for the tourists. The charge for two people in a cottage full board, including an elephant ride and some souvenirs, is 2800 rupees (USD 57).

The Forest Department also has trained 74 guides from the local villages who, along with local drivers, take tourists into the Park using 77 privately owned jeeps (that must be green and display an official emblem). No other private cars are allowed, so these are other ways of helping the local people. The entrance fee for Indians is 40 rupees (USD 0.85) and for foreigners double that, on top of which the vehicle charge for a one-and-a-half-hour trip is on average 1140 rupees (USD 23). Tourists can be driven to several watch towers or go on elephant rides.

In the financial year 2010/11, there were 61,256 Indians and 66 foreigners (mostly British) entering Gorumara NP. Of all the money received by the Forest Department from tourism, the local communities receive 25% since 1997. In 2010/11 this amounted to 4,614,750 rupees (USD 98,186) (Debnath, pers. comm., February 2012). This money is given to nine eco-development committees (with a total of 52 members) representing over 1600 families in the villages surrounding the Park (about 8000 people). The

Forest Department staff have monthly meetings with the committee members and together decide how the money is to be spent and, with help from the officials, how to implement projects. Many projects such as culverts, irrigation channels, ring wells, mushroom and poultry farming have been funded successfully. Recent funding is going towards educating students, torches and batteries to scare elephants, agricultural tools, electric fences to protect crops and villagers, producing non-palatable cash crops that elephants, especially, do not eat (such as ginger and black pepper), and other alternative income-producing businesses.

Villagers also benefit from the Park through direct employment as temporary workers. In early 2012 there were 108



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Kalipur Eco-village, set up by the Forest Department next to Gorumara National Park, supports the villagers with employment in various tourist enterprises.



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Medhla Watch Tower is used both by Forest Guards to look out for poachers and by tourists to Gorumara National Park to view animals.

casuals working in Gorumara NP on the roads, carrying out foot patrols, helping mahouts cut grass for their elephants, and carrying out habitat management jobs. The Forest Division also employs villagers to cut trees in the surrounding forest plantations and load logs into lorries, bringing extra income and good relations with the local people.

There are a growing number of lodges around the Park for tourists to visit this scenic area that is so close to the Himalayas. This brings in more wealth and the villagers are aware that with few industries to employ them in North Bengal tourism is a major benefit.

GREATER AWARENESS OF VILLAGERS TO PROTECT RHINOS

The Forest Department carries out education programmes in the area on the importance of wildlife conservation, with emphasis on rhinos and elephants as flagship species. The villagers now understand the importance of the Park, being aware of the benefits they receive if they in turn help protect the Park. The local people assist in several ways. They provide information to the Forest staff on potential poachers for which they are paid. The fringe villagers have become the eyes and ears for the Park's protection and officials realize that the best fence is the human fence made up of the local people (Debnath, pers. comm., February 2012). When there is need for fire control or to counteract increased poaching pressure (such as at festival time,

especially Holi), the Forest Department calls in more local people (about 500 a year working about 5000 man days especially in the dry season) to help in the Park as fire watchers and patrol the boundaries. Villagers are willing to assist with this extra work out of motivation and devotion to conservation as they know they receive benefits from the Park staff in ecotourism, and if rhino poaching occurs it is possible the generous budget may be cut accordingly. (Debnath, pers. comm., February and June 2012).

HABITAT MANAGEMENT

According to Debnath, of the Park's 80 km², only 10 km² found along the rivers in the southern area (12.5%) is grassland suitable for rhinos. Thus there are about 4 rhinos per km² in this nutrient-rich grassland. In order to expand the grasslands, an additional 30 km² of floodplain adjacent to the south-east part of the Park may be chosen to add to the Park which would increase the ratio of grassland to forest to 50% (Debnath, pers. comm., February 2012). This area along the Jaldhaka River is presently communal grazing land without any villages.

Jaldapara Wildlife Sanctuary

RHINO NUMBERS AND RHINO POACHING

In 1992 a census recorded 33 rhinos. By 2006 a census revealed 108 rhinos, and for the most recent census in 2011 there were 149–155 (Martin, 2006; Prakash, 2011) (fig. 2). The 2011 count took place over two days with 152 counted on 11 April reduced to 149 due to double counts, and 155 counted on 12 April. The rhino habitat was divided into 36 enumeration blocks; 232 field staff, 15 participants from 8 NGOs and 36 Forest Department elephants were used (Prakash, 2011).

In the 1990s, one rhino was poached in 1991, 1992 and 1993 and 1997, followed by two in 1998, and one in 1999. For the 2000s, one was poached in 2000 and 2001, two in 2008 and one more in 2009 (Guha, 2007; Talukdar, 2011; Rajendra Jakher, DFO, Wildlife Division III, pers. comm., February 2012). Thus, there has been a reduction in poaching from eight in the 1990s to five in the 2000s, although it is possible

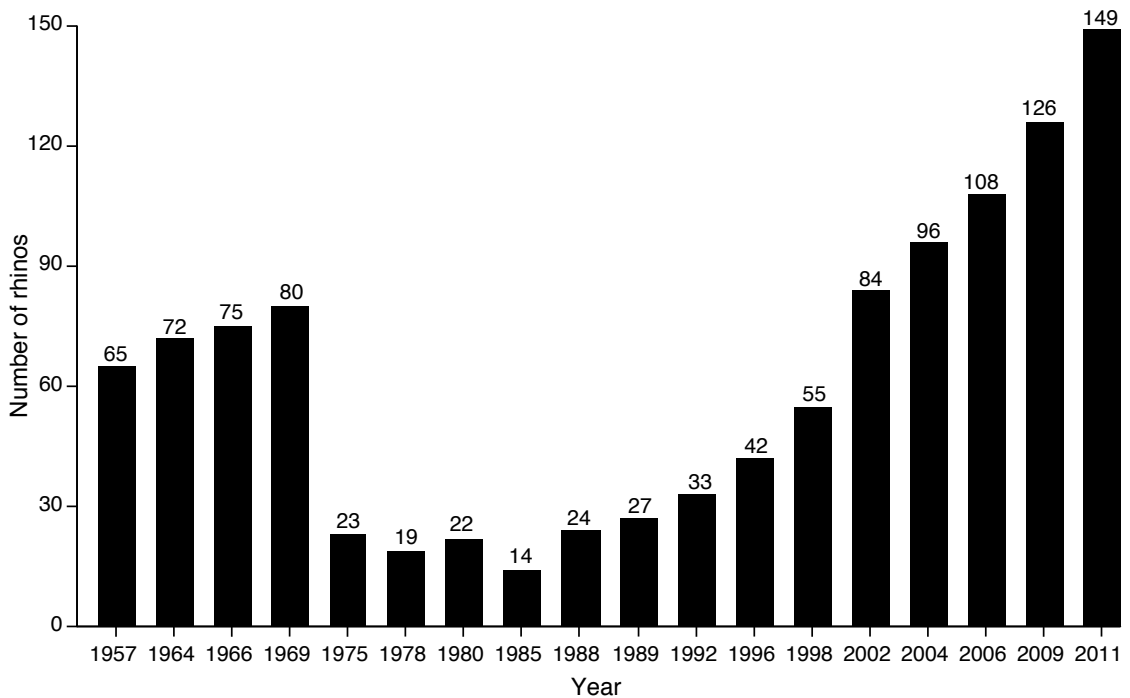


Figure 2. Population of greater one-horned rhinos in Jaldapara Wildlife Sanctuary.

that one or two others could have been poached, but not found.

The last known poached rhino was shot inside the Sanctuary in late 2009 with a country-made gun similar to those used in Kaziranga National Park in the State of Assam; the poachers thus probably came from Assam. Nearly two months later the wounded rhino was found still alive with its horn intact. A veterinarian tried to save it but it died a few days later. The gang was not caught (Jakher, pers. comm., February 2012 and Niranjita Mitra, assistant wildlife warden, Jaldapara WLS, February 2012).

In mid-2011 another gang attempted to poach a rhino. According to Jakher and Mitra, field staff spotted the gang inside the Sanctuary, chased them but could not catch them. The staff found a rifle, 14 cartridges, an axe and a newspaper from the north-eastern State of Nagaland. The poachers were thus probably Nagas, who are the main poachers of rhinos in Assam.

HIGH GOVERNMENT BUDGETS

As for Gorumara, Jaldapara has continued to receive funds directly from the Central government and also from the State government. State funds for Jaldapara come under Wildlife Division III, which also includes the offices at Cooch Behar and nearby protected areas,

together employing 406 permanent staff. Of these, 188 or 46% were working in Jaldapara as permanent field staff in 2011. Thus 46% of the State government budget (using the same methodology as for Gorumara NP) for 2010/11 for the Sanctuary alone was about 57,917,232 rupees (USD 1,232,281). The State government divides this into State-Plan (for capital expenses) of a calculated 14,643,612 rupees (USD 311,566) and Non-Plan (for recurrent expenses) of a calculated 43,273,620 rupees (USD 920,715). Funds from the Central government's CSS for the Sanctuary alone were 9,772,750 rupees or USD 207,931 (DFO's office, West Bengal Forest Division, Wildlife Division III, Cooch Behar, unpublished data). This totals 67,689,982 rupees or USD 1,440,212. The budget has thus doubled in rupees and dollars since the early 2000s (Martin, 2006).

HIGH NUMBERS AND MOTIVATED PARK STAFF

If the budget calculated for the Sanctuary for the financial year 2010/11 (USD 1,440,212) is divided by the size of the Sanctuary, about USD 6,652 was spent per km² in 2010/11. This permitted in 2011 the Sanctuary to have 188 permanent field staff: 14 range officers/forest rangers, 44 beat officers, 12 head forest guards and 118 forest guards. There were 230 casual or temporary staff who work mostly in anti-

poaching activities, including mahouts, etc. Therefore, the total number of field staff was 418, which is close to two people per km², similar to Gorumara, and one of the highest in the world. Domesticated elephants have risen from 47 in 2006 to 55 in 2012 of which 28 are used for patrolling (including about 4 for tourist rides), 6 for activities in the towns, and the rest are young (sometimes rescued from the forest when they are separated from their mothers at river crossings). There are more elephants being used for patrol work compared with the past, which is safer than forest guards' walking, and elephants allow better patrolling in the rainy season, in tall grass, and in difficult terrain such as river beds. Since 2005 at least 4 more watch towers have been built, making a total of 13 in the Sanctuary that have assisted the staff in protecting it further (Jakher, pers. comm., February 2012); these factors have helped increase staff morale.

BENEFITS TO LOCAL COMMUNITIES

There are over 150,000 people surrounding the Sanctuary in forest villages, fringe villages, revenue villages (which include tax payers) and tea gardens.



Tourists enjoy rides on elephant back in Jaldapara Wildlife Sanctuary which start from the Hollong Forest Lodge.



Boating at South Khalibari is one of the tourist activities started by the Forest Department to bring an income to the villagers and to reduce the pressure of too many visitors going to the sanctuary by offering alternative eco-activities.

Most of the people around Gorumara are landless labourers and marginal farmers. The main wildlife problems facing the local people are human injury, death, and destruction of property and crops, especially from elephants. Rhinos rarely wander further than 500 m outside the Sanctuary because of the high human population density, but in February 2012 a rhino injured a villager close to the Sanctuary. As for Gorumara, compensation is given willingly for human–animal conflict, which helps maintain good relations and trust with the villagers.

There are many visitors to Jaldapara, but the Forest Department is reluctant to open the Sanctuary to more tourist vehicles that would disturb the animals. Only one road is available into the Sanctuary to visitors, which goes to a government lodge and salt lick; four elephants take tourists into the forest. Areas bordering Jaldapara's boundaries are densely populated, so the Forest Department has developed two main eco/nature-parks for visitors to have picnics or stay the night (Jakher, pers. comm., February 2012). Many Bhutanese picnickers come during holiday times when the eco/nature parks

become very crowded, showing the need for such picnic areas to reduce pressure on the Sanctuary and as a way for the local people to make money.

Kunjanagar Eco Park was started in 2000. By 2005/06 it was attracting 79,205 visitors and generating revenue worth 759,001 rupees (USD 17,056) (Guha, 2007) in that year. The main attractions are three cottages for hire at 825 rupees (USD 17) per night each in early 2012, enclosures with wild animals such as a leopard, spotted deer, parrots, the rare gharial, and peacocks, etc. There is a popular playground with swings, a watch tower facing the river boundary into the Sanctuary and a large suspension bridge crossing into the Sanctuary that visitors can enjoy walking across (but not into the Sanctuary). Entry fees were 10 rupees (USD 0.20) for everybody in early 2012. All the employed staff are from the surrounding communities. Besides wages the villagers receive parking fees (20 rupees of USD 0.41 for a small car), 10% of the gross cottage fees, catering for the cottages, etc. The range officer for South Jaldapara supervises the Eco Park.

South Khalibari Nature Park was started in 2003. By 2005/06 it already had 29,953 visitors bringing in 964,020 rupees (USD 21,304) (Guha, 2007) for that year. It has enclosures for tigers (20 tigers in 2003 and 6 in 2012 from circuses in India) and eight leopards rescued from tea gardens. There is a river for boating and a popular playground, as well as grassy areas for picnics. In early 2012, entry was 15 rupees for adults and 5 rupees for students, with extra charges for cameras and picnicking. Eleven local staff look after the three cottages and help pick up litter. Prices for Kunjanagar are low so it is affordable for many.

The community also benefits from work in the Sanctuary. There are 25 local villagers acting as guides, and many of the jeeps are provided by the villagers also. Similar to Gorumara, villagers work in the Sanctuary as casuals (about 230 employees), etc.

The villagers receive 25% from Sanctuary entry fees and bed nights from the Forest Department. This 25% along with funds from the State government give them significant financial support; the Forest Department helps manage various eco-development projects for the people, similar again to Gorumara. With

the pressure of illegal timber cutting and firewood collection in the Sanctuary especially acute (due to the long Sanctuary boundary in the shape of a pair of trousers, which is difficult to patrol), the Forest Department is eager to support the use of gas instead of wood for cooking to alleviate encroachment.

GREATER AWARENESS OF VILLAGERS TO PROTECT RHINOS

As for Gorumara, the Forest Department staff realize the importance of financially assisting the locals around the Sanctuary so that the fringe villagers can see its direct benefit. This is in contrast to the approach adopted in the past when wildlife staff worked in isolation from the forest fringe dwellers and ruthless policing was thought to be the only effective way of control (Guha, 2007). The villagers now understand that if they do not help to prevent poaching, and if rhinos, especially, are poached, there will be negative publicity on the Sanctuary, tourism will drop and the funding to them may get obstructed. If the villagers protect the Sanctuary, they are aware that they receive financial benefit (Jakher, pers. comm., February 2012). There is an excellent interpretation centre opened in 2007 near the main government lodge outside the Sanctuary that encourages conservation awareness to villagers and visitors alike which Gorumara intends to emulate.



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The range officer, Mr Debnath, gives talks to children near Gorumara National Park about the forest and its wild animals to increase awareness and support, such as here at an education/entertainment centre built by the Forest Department for the people at Dhupijhora Beat.

As for Gorumara, the villagers help when needed in the Sanctuary with up to 1000 people a year coming inside to give extra protection during festival times when poaching increases, or to help with fire control, for which they are paid in kind with firewood and thatch.

Officials in the Forest Department rely on information from the villagers on potential rhino poaching and timber smuggling, and pay them accordingly. Officials also obtain data from informers working in tea stalls and tea gardens.

HABITAT MANAGEMENT

Of the Sanctuary's 216.5 km², 99 km² are suitable for rhinos (44%) (Guha, 2007). Of this area, 14% is uniform grassland and 30% mosaic grassland mixed with acacia and *Dalbergia* species. According to Jakher (pers. comm., February 2012), the present carrying capacity for rhinos in the Sanctuary is around 250, but he is organizing an expansion of the grassland by clearing trees and planting grasses to increase rhino habitat. For the financial year 2011/12 he has scheduled developing 100 ha of new grasslands.

SEIZURES OF RHINO PRODUCTS

West Bengal's two rhino populations are close to the porous borders of Bangladesh, Bhutan, China and Nepal which makes it difficult to follow the trail of illegal wildlife products once they enter these countries. However, there have been recent official seizures of rhino products within India. The main commercial city in North Bengal, Siliguri, is still a major hot spot for wildlife products (Samir Sinha, head, TRAFFIC India, pers. comm., February 2012; Vivek Menon, executive director, Wildlife Trust of India, pers. comm., February 2012). One horn was seized there in 2006, and two more in two seizures in 2010. Two other horns were seized in two seizures at the Indian border town to Bhutan called Jaigaon in 2006 and 2009. There was another seizure of 16 kg of rhino skin also at Jaigaon in 2006. For India as a whole (including the horns and skin mentioned), from 2005 through 2011 there were 23 seizures of rhino horn totalling 27 horns, and 3 seizures of rhino skin (weighing 42 kg) with one of these seizures including 25 kg of rhino bones that occurred in the State of Manipur (Wildlife Protection Society of India, Wildlife Crime Data Base, unpublished).



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Women collect firewood in the forests surrounding Jaldapara Wildlife Sanctuary.

SUCCESSSES IN THE JUDICIARY

A reason there is not more rhino poaching in West Bengal is that poachers are not paid enough by the middlemen to warrant the high risk of getting caught and being punished. The penalties for poaching and trading in rhino products work as a deterrent. There has been a concerted effort towards a collaborative approach to law enforcement with the Forest Department coordinating their knowledge with the police, customs and the judiciary. As a result, the judiciary sentences poachers with fines and imprisonment, rather than letting them off. According to Srikanta Ghosh, Range Officer of Jaldapara North, the maximum jail sentence for poaching a rhino is seven years with an average sentence of two to three years.

ABSENCE OF CHINESE AND VIETNAMESE RHINO HORN TRADE NETWORKS

Chinese and Vietnamese traders of wildlife products are virtually absent in India. The Indian government does not provide many work permits for foreigners who may compete for jobs with Indians. Indians are wary

of outsiders, especially East Asians, in their country and do not want them competing with their businesses. Few Chinese and Vietnamese thus feel comfortable working in India and due to their ethnic appearance they cannot merge into the communities unnoticed to carry out illegal activities (Belinda Wright, Executive Director, Wildlife Protection Society of India, pers. comm., February 2012). This is in contrast to Africa, where Chinese and Vietnamese have become some of the major illegal traders in rhino horn, aided by the huge increase in Chinese becoming resident in Africa in the 2000s (TRAFFIC, 2009, 2010).

Discussion

Since the early 1990s rhino numbers have increased significantly and poaching has declined considerably in Gorumara and Jaldapara. From June 1990 when the central government introduced the 'eco-development around national parks and sanctuaries' to assist the fringe villagers, officials in West Bengal have worked hard towards accomplishing this. In recognition of the villagers' work in wildlife conservation, they started in 1997 in Gorumara to receive a 25% share of the revenue earned through ecotourism, and also in Jaldapara for entry fees and bed nights, so the local people now really appreciate the value of protecting rhinos.

The poaching pressure around Jaldapara is harder to contain due to the Sanctuary's long boundaries that allow easier access inside. Furthermore, higher human density in close proximity to Jaldapara makes it harder for Forest staff to reach all the people and win their confidence and trust. However, as the years go on Jaldapara staff are reaching more people and they have built a very good interpretation centre.

Regarding tourism, Jaldapara has only one road for visitors into the Sanctuary as opposed to six leading to watch towers in Gorumara. Jaldapara also has half the number of elephants for tourist rides but uses many more for patrol work. The Jaldapara staff do not encourage tourism because there are fewer forested buffer areas around Jaldapara for the animals to escape from people. With fewer scenic forested areas around Jaldapara compared with Gorumara, the many visitors, including Bhutanese at holiday times, need somewhere to go especially for picnics. So the Jaldapara staff support two main eco-nature parks nearby that also benefit the villagers employed there.

Although there is still substantial human-wildlife

conflict in the region, there has been only one retaliation killing of an elephant (the main cause of death and injury) since 2006 in North Bengal. The people are accepting and tolerant, especially with the Forest Department's growing empathy towards them. This support is strengthening, as demonstrated by the proposed rise in compensation for death that will continue to improve the good will of the local people. Unlike some other State Forest Departments, West Bengal provides compensation for damages even for crops, as well as for people, livestock and housing, thus improving relations even more.

The Forest Department is trying also to improve conditions for personnel in the field, aware that good leadership and motivated staff are the key to success in combating poaching. The increase in salaries has been a major boost, along with the provision of mobiles. However, the number of permanent field staff in Gorumara has dropped (because of retirement and lack of recruitment) in favour of casuals. In order to increase staff morale, perhaps this could be rectified. Problems facing both protected areas are the need for more training in the field, and the need for young, energetic, enthusiastic field personnel for patrol work. The terrain is often rugged, and riding elephants becomes difficult for the older guards who are the majority. Younger staff also are more technically able (for example with GPS). But most young recruits are no longer willing to live in such remote areas on 24-hour call, with few chances to see their families. More facilities are needed for them, such as bicycles and motorbikes, along with modern weapons to boost their effectiveness and dignity in this hardship profession. Incentives and rewards for the challenging job of protecting rhinos against poachers could also be improved.

Though rhino poaching is under control, more rhino deaths have occurred in recent years from male infighting and forced matings, especially in Gorumara where some females have died recently due to male rhinos mounting females ([particularly young, pregnant and lactating females) for too long that then get stuck in the mud (Debnath, pers. comm., February 2012). The problem is that Jaldapara's sex ratio is 1:1 and Gorumara has a sex ratio of 1 female to 1.5 males, excluding calves (as opposed to the ideal ratio for breeding of 3 females to 1 male) and this puts considerable pressure on the rhinos (Debnath, pers. comm., July 2012; Prakash, 2011). The solutions are to expand more grassland areas, to reintroduce wild female rhinos from elsewhere (also for genetic

diversity), and perhaps to take out some of the more aggressive males and keep them in a separate large enclosure that would in turn benefit eco-tourism, allowing visitors to see rhinos without so much disturbance to those roaming free.

Conclusion

The West Bengal Forest Department deserves to be acknowledged for its continued successful rhino conservation. Corruption and political interference could disrupt this great achievement. Staff in the Wildlife Divisions know that they cannot become complacent as they live on a knife edge, a potential time bomb, with the price of rhino horn increasing and with close access to China and other countries to where rhino horns can be easily smuggled and lost on the illegal trail to their unknown destinations. Officials and conservationists in India, as in African countries, are aware that coordination regarding intercountry intelligence must be improved. Yet even without this, Gorumara NP and Jaldapara WLS staff must be congratulated for their huge success in rhino protection and their dedication to improving continuously their strategies to prevent poaching. It is important for other rhino range states, NGOs and conservationists in Asia and Africa to ascertain which policies carried out in West Bengal may work and then have them implemented in their rhino areas to improve rhino protection.

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