
THE IMPORTANCE OF PARK BUDGETS, INTELLIGENCE NETWORKS AND COMPETENT MANAGEMENT FOR SUCCESSFUL CONSERVATION OF THE GREATER ONE-HORNED RHINOCEROS

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INTRODUCTION

Since the late 1960s the greater one-horned rhinos in India and Nepal have been increasing steadily in numbers largely due to high park budgets and good management. Poaching increased in both countries, however, in the early 1990s. Subsequently, more funding for intelligence networks around some of the national parks and improved park management reduced poaching significantly in 1994 and 1995. This paper will examine methods used in India and Nepal to reduce the recent spates of poaching. It will also point out why some rhino areas in India are still insecure.

INDIA

The north-east state of Assam (see map) is home to 1,500 rhinos, 95% of India's total rhino population. Poaching was serious in 1992 and 1993 in Assam. This was due to a number of factors including political in-

stability (especially around Manas and Kaziranga National Parks), inadequate intelligence funds, a cut back in funds for management in several protected areas, poor leadership in certain parks and wildlife sanctuaries, low morale of forest guards, and no arrests of rhino horn traders (Vigne & Martin, 1994). In Assam, 70 rhinos were poached in 1993, but in 1994 the situation turned around when only 31 rhinos were poached (see Table 1), while 35 were poached in 1995 (up until 1 November). The small rhino populations in West Bengal and Uttar Pradesh have also been secure recently. India's rhino conservation success is due to several reasons combined, including the arrest of some major traders. Until 1995 few such arrests had ever been made by the Indian authorities. Certain non-government organisations (NGOs), notably TRAFFIC India and the Wildlife Protection Society of India, have helped the government by providing information on the trading syndicates, largely through the help of informers. In June 1995, police officers caught five people in the town of Siliguri in West Bengal who offered to sell 60 rhino horns and were in possession of two. These two horns probably originated from Assam and would have been sent to Bhutan for export to eastern Asia. The leader of the smuggling syndicate was of Taiwanese origin who had trading connections in India, Bhutan, Nepal and Taiwan. This trader claimed to have supplied the 22 rhino horns which a Bhutanese princess carried from Bhutan to Taiwan in September 1993 (Anonymous, 1995). In August 1995 another businessman was caught in Calcutta with rhino horn, elephant ivory and tiger skins. Until the Siliguri-Bhutanese connection became important, Calcutta was the main entrepot for rhino horn from India. Since the late 1980s, however, the Indian authorities have intensified their efforts in this area so the Calcutta trade route is less significant. In October 1995 another horn was seized in Siliguri. This small town has become India's main entrepot for rhino horns, being near Assam, Nepal and Bhutan and being a junction for most transport routes in the region. Siliguri thus attracts many businessmen including those dealing in endangered wildlife products. It has been a major breakthrough that two big rhino horn traders in this town have been caught.



Photo credit: Lucy Vigne

Unlike ivory rhino horn deteriorates quickly if not properly treated.

Table 1. Number of known rhinos poached in Assam.

Year	Kaziranga NP	Manas NP	Orang WS	Pabitora WS	Other areas	Total
1992	49	11	2	3	2	67
1993	40	22	1	4	3	70
1994	14	4	7	4	2	31
1995*	21	1	9	2	2	35

* up to November

Source: Forest Department of Assam



A map showing the main areas referred to in the text.

Assam's Kaziranga National Park

Kaziranga holds 1,300 rhinos, nearly 90% of Assam's rhino population. The recent drop in rhino poaching in India thus relates closely to improved rhino conservation in and around Kaziranga.

First, money spent on information about poachers and middlemen around Kaziranga increased ten times from 1990/1 to 1993/4: from \$199 to \$2,108 (see Table 2). In 1994 12 rhino poachers were killed and 46 arrested compared with four killed in 1991 and only 25 arrested. However, the District Forest Officer at the Park headquarters in Bokakhat said he needed 200,000 rupees a year (\$6,000 in late 1995) to pay for even more informers. In 1995 10-15 people were on the books as informers, and with more informers poaching would be reduced even further.

Table 2. Amount of money spent by the Forest Department of Assam in and around Kaziranga National Park for intelligence gathering operations.

Year	US\$	Year	US\$
1990/1	199	1993/4	2,108
1991/2	279	1994/5	1,224
1992/3	881		

Source: Forest Department of Assam

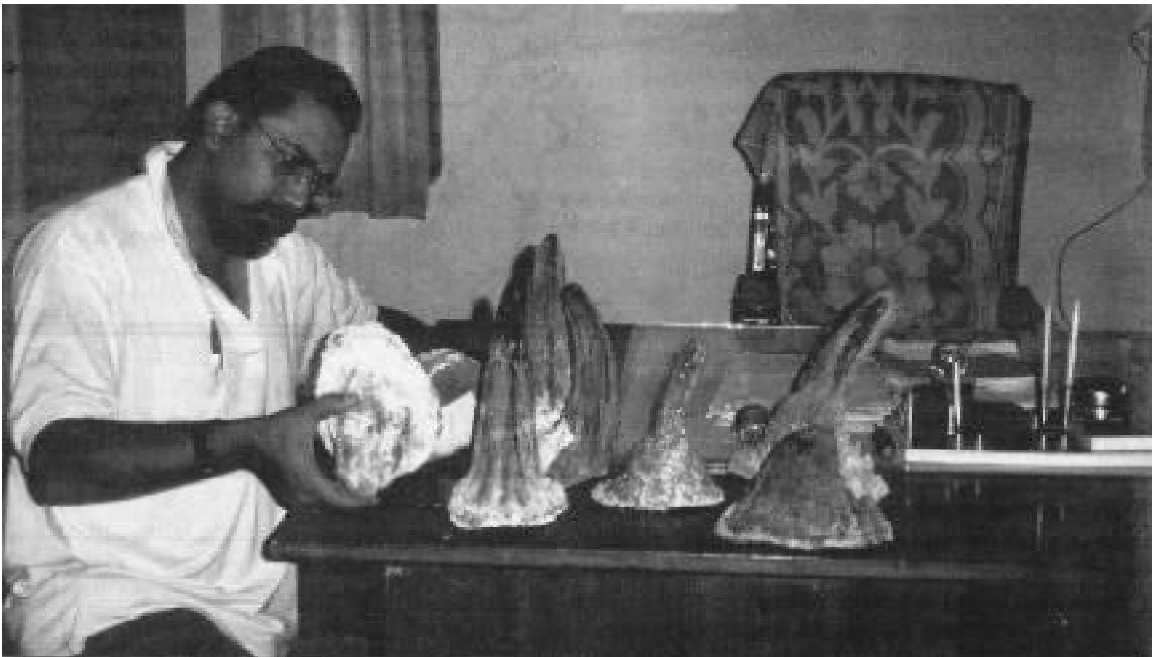
Second, the police around Kaziranga have become more involved in stopping the rhino horn trade. With the Park staff's new knowledge on poachers and traders, they have had greater co-operation with the police. The police have been also less preoccupied with terrorists recently. It is only the police who have the

authority to organise arrests in the villages, and in 1994 and 1995 the police and Forest Department staff carried out at least nine joint raids which resulted in the deaths of four poachers and the arrests of 20 men, while six firearms used to kill rhinos were confiscated (Assam Forest Department, 1995).

Third, Park management has improved. The Director of Kaziranga National Park has made efforts to ensure that he has the most competent and experienced three range officers who have motivated their men and improved patrol work. These range officers have been responsible for overseeing a number of encounters with poachers from 1993 up to November 1995 resulting in 116 arrested and 24 killed (see Table 3). The range officers supervise the 204 forest guards, 60 boatmen, 62 foresters, 56 game watchers and other men inside Kaziranga. There are 435 full-time staff involved in anti-poaching work based at 113 camps in the Park, which works out at over one man per km², a very high con-

centration of manpower, and an excellent poaching deterrent, when managed correctly. The Forest staff put a lot of effort into their work, risking their lives in trying to catch poachers in the difficult terrain and often swampy conditions of Kaziranga. This is a great feat considering that the men are not trained in guerilla warfare. Because of this, poachers can still sneak inside the Park, shoot a rhino, and come out without being caught. In 1993 poachers often shot rhinos on moonlit nights, so patrol work was intensified at night. As a result, poachers in 1994 reverted to day-time shooting, which fortunately is easier to detect (Pankaj Sharma, Range Officer, Baguri, pers. comm., 1995). Some of the forest guards were re-positioned in camps along the Park's heavily human-populated southern boundary, and more patrol boats were put onto the Brahmaputra river on the northern boundary. In late 1995, however, six of the 12 boats with engines were broken as were 27 of the 110 small country boats (C.R. Bhobora, DFO, Kaziranga National Park, pers. comm., 1995).

Photo credit: Esmond Martin



Pankaj Sharma, Range Officer in Baguri for western Kaziranga National Park, examines rhino horns from his strong room.

According to S.K. Sen, Director of Kaziranga National Park, rhino poaching in 1995 has been occurring in the central part of the Park by gangs still entering either from the north side across the Brahmaputra river or from the vulnerable southern boundary. In 1995 (up to 1 November) six rhinos were caught by poachers in hand-dug pits and 15 were shot, mainly by gangs organised by traders from Nagaland,

a neighbouring state (see Table 4). In 1995 gangs of four to six people earned about the same as the previous few years for a horn, working out at \$885 to \$2,556 per kilo of horn, a sizeable sum for a gang of poverty-stricken villagers. Nevertheless, it is an encouraging sign that the price of rhino horn has not gone up recently, although fewer new rhino horns are now on the market.

Table 3. Encounters and raids in Kaziranga National Park, Assam.

Year	Poachers killed	Poachers arrested	Arms recovered	Ammunition recovered	Horns recovered
1993	8	67	19	49	4
1994	12	46	9	60	1
1995*	4	3	1	22	2

* up to November

Source: Forest Department of Assam

Table 4. Rhino mortality in Kaziranga National Park, Assam.

Year	Poaching methods			Poached	Death from natural causes	Total
	pit	gun	electrocution			
1992	2	45	2	49	66	115
1993	2	38	0	40	58	98
1994	3	11	0	14	37	51
1995*	6	15	0	21	47	68

* up to November

Source: Forest Department of Assam

Fourth, there has been increasing NGO support. The Rhino Foundation for Nature in north-east India gave equipment to Kaziranga's field staff, the first NGO to do so for many years. The Rhino Foundation, which was established in 1994 and is supported by several tea companies in Assam and West Bengal, donated, in 1994 and 1995, 450 pairs of hunting boots, 250 raincoats and 50 water filters to the staff. The Foundation has also been helping the farmers around Kaziranga by inoculating their domestic animals in 1994 and 1995. In addition, the Tiger Link rewarded three range officers, one informer and one home guard in and around Kaziranga the equivalent of \$312 each in 1995. These NGO contributions have raised mo-

rale of the Park staff, improving their patrol work, and have helped to reduce hostility from local farmers towards the Park.

Fifth, the Assam government budget of Kaziranga (a park of 430km²) increased slightly in 1994/5 compared with the year before (after taking into consideration an 8% inflation rate) to \$1,552 per km². This is one of the highest figures per unit area in Asia (see Table 5). This budget provides substantial benefits to the running of the Park, including salaries for a large anti-poaching staff. Nevertheless, more funds are needed if the Park is to be properly maintained and developed in future the years.

Table 5. Government budgets for rhino protected areas in Assam.

Year	Kaziranga NP	Manas NP	Orang WS	Pabitara WS
1992/3	\$529,456	\$441,476	\$136,818	\$232,669
1993/4	582,930	503,124	131,559	234,954
1994/5	667,374	515,119	152,521	232,678

Source: Forest Department of Assam

Assam's Manas National Park

Unlike in Kaziranga, rhino poaching has remained a serious problem in Manas National Park. From 1990 to 1995 Manas lost most of its rhinos (see Table 1). The main reasons are due to serious political disturbances in the area, a lack of adequate funding and manpower, and security problems.

First, continuing since the late 1980s there has been a break down in law and order, until very recently, due to the political disputes. As a result, many rhinos were poached. For example, in March 1993 one gang leader from the Bodo tribe organised the killing of at least 13 rhinos. The man lived only a few kilometres from the area headquarters of Bansbari in the village of Khabsinpara (Ajoy Brahma, Range Officer, Bansbari range, pers. comm., 1995). From 1990 to the end of 1993, perhaps just over half of the estimated 90 rhinos had been killed. In 1994 at least four more were killed in the central Bansbari range. Bhuyanpara (the eastern range) and Panbari (the western range) were rarely patrolled from 1989 onwards due to the fear of Bodo terrorists hiding in the forest. It is likely that virtually all the rhinos in these two areas had been eliminated by 1994. There is information on only one poaching gang operating in 1994 in Manas. This gang of four from Nalbari District, all armed with rifles, shot a rhino and cut off its horn which weighed about 625 grammes. It was bought by a man from Guwahati, Assam's capital, for the equivalent of \$2,555 a kilo (Brahama, pers. comm., 1995). In 1995 up to early November, another rhino was known to have been shot in the Bansbari range.

Since it has not been possible to carry out a census nor even to patrol large parts of Manas due to the political upheavals, the number of surviving rhinos is a guess. Two females with calves were seen in the Bansbari range in 1995 and its range officer believes that perhaps 20 remain in the entire Park (Brahama, pers. comm., 1995).

Manas Park has been facing additional problems since 1989 due to the political problems in the area. In 1994 and 1995 seven wild elephants were killed for their tusks (Brahama, pers. comm., 1995), and in 1995 two domesticated elephants had their tusks removed while their mahouts were held at gunpoint (Rajendra Agarawalla, Field Director, Manas Tiger Project, pers. comm., 1995). Furthermore, a considerable number of trees has been cut down for timber, while rhino horns and firearms have been stolen from the Forest Department, and six Forest staff have been murdered (Deb Roy, 1994).

Second, throughout this difficult time, Manas staff did not receive adequate funds nor equipment to maintain a strong presence, and many camps were evacuated as areas were unsafe. By November 1995 only 20 of the 43 forest guard camps were occupied and the morale of the remaining field staff was low with little incentive to patrol (Deb Roy, 1994; Menon, 1995). Funding for Manas has still not been sufficient for its rehabilitation. The government budget, when corrected for inflation, dropped slightly in the financial year 1994/5 compared with the year before (see Table 5). The budget of the core area (520km²) of Manas was \$515,119 in 1994/5 or \$991 per km², much lower than Kaziranga's \$1,552.

Third, Manas has several security problems. The intelligence network around Manas is ineffective. A group of informers needs to be re-established urgently, for which only a small sum of money would be required.

Further aggravating the security problem, a new road in the adjoining Royal Manas National Park in Bhutan has been built. Construction commenced in 1994 to allow easier access into the area. This will benefit poachers and traders also, and is of concern to the Park staff.

The Park could face an additional security threat due to the fact that Manas re-opened to the public on 1 October 1995, making it difficult to distinguish between poachers and legitimate visitors. It had been closed to all Indian and foreign tourists since 1989 as it was not then safe, but now the area is relatively stable. It is essential to protect the rhinos, whose whereabouts will be known once more by the public. Whether or not the Park is now revamped properly is critical to the future of this World Heritage Site, which is home to many endangered and several rare, endemic species.

Assam's Orang Wildlife Sanctuary

One other important rhino area in India has suffered recently, Orang (or Rajiv Gandhi) Wildlife Sanctuary. In 1992 only two of its hundred or so rhinos were poached, and 1993 witnessed only one rhino poaching incident, due to very good park management at the time. In 1994 seven rhinos were illegally killed, however, while in 1995 (up to 1 November), the figure reached a record nine, representing about 10% of the population. Again, reasons are similar as for Manas.

First, in 1994 there was a breakdown in law enforcement due to local agitation. The main radio set in the Sanctuary was stolen and not replaced as the Forest

Department feared it would be stolen again. Therefore, communication with the forest guards in the field broke down. Guns were also stolen, apparently by Bodos, and senior Orang officials have been reluctant to release more guns to the forest guards. Deprived of their radio network and firearms, the morale of the forest guards has suffered and patrolling has been far less intense than in 1992 and 1993.

Second, there have also been financial constraints in Orang. Its government budget declined by over 12% (adjusted for inflation) from 1992/3 to 1993/4, but in 1994/5 it was increased to \$152,521 or \$2,018 per km², higher than for Kaziranga. Despite this, some of the camps are poorly maintained. Orang needs better management and stronger, more enlightened leadership to make available radio communications and firearms once more and to increase staff morale.

West Bengal

The state of West Bengal (see map) was once rich with rhinos. Today, two small, but growing, populations remain. In 1995 there were 35 rhinos in Jaldapara Wildlife Sanctuary (216.5km²) and 18 in Gorumara (expanded from an 8.5km² wildlife sanctuary to a 79.52km² national park in 1995). There was no poaching in either area in 1994 or 1995 (up to November), but there were four natural deaths: an old male died from fighting, a female calf was killed by a tiger, one drowned in a wallow, and a male died of lung congestion.

There are two main reasons for the lack of poaching. First, in 1995/6 the government budget for Jaldapara was \$105,422 or \$487 per km² and for Gorumara, \$24,096. Out of these budgets a small (but adequate) amount is paid to gather information on potential poachers, and it is obviously a good deterrent as there has been no rhino poaching since 1993 (S. Roy, Chief Wildlife Warden, West Bengal, pers. comm., 1995). Second, informal eco-development committees have recently been established, 10 next to Jaldapara, and four around Gorumara, consisting of local families who help protect and manage the wildlife.

Uttar Pradesh

There are two other, even smaller, rhino populations in India and there has never been poaching in either of them. Dudhwa National Park (see map) had 11 animals in 1992 and 13 in late 1995. These rhinos were translocated into this area in 1984 and 1985. The rhino sanctuary has remained safe from poachers, mainly because it is entirely electrically fenced. The other rhino

population was kept secret by the Indian authorities until late 1995, the main reason, no doubt, for its survival. This population of at least five rhinos occurs in the Katerniaghat Wildlife Sanctuary, about 40km east of Dudhwa, close to the Nepal border. The origin of these rhinos has fascinating political overtones. In 1986 13 rhinos from Nepal's Royal Chitwan National Park were translocated to Royal Bardia National Park in western Nepal, near India's border, to start a new population. Soon afterwards, three wandered out of Bardia and into India (Martin & Vigne, 1995). In 1991 25 more rhinos were moved from Chitwan to Bardia. From 1986 to 1994, 17 calves were born in Bardia while two or three more rhinos moved into India in and around the Katerniaghat Wildlife Sanctuary. At first, India's Forest Department staff fenced in the rhinos for the animals' security, but later a part of the fence was taken down to allow them to move wherever they wished (S.C. Dey, Addl. Inspector General of Forests and Director of Wildlife-Preservation-for India, pers. comm., 1996). The Nepalese complained to the Indian authorities for not sending the rhinos back to Nepal. However, the official Indian policy remains as follows: "Wild rhinos do not understand international political boundaries; these rhinos are free to go back to Nepal, [but it would] be inappropriate to take any step to drive them back to Nepal, as that would be against the concept of trans-border movement of animals and trans-border species conservation (Dey, pers. comm. 1996). Fortunately, rhino poachers do not exist in the area and for the moment they are relatively safe.

NEPAL

The early 1990s were the worst years for rhino poaching in Nepal (see map) for over 20 years. In 1992 17 rhinos (from a population of over 400) were killed illegally in Royal Chitwan National Park and one was shot dead which had wandered out of the Park (Martin & Vigne, 1995). Royal Bardia National Park, Nepal's only other protected area for rhinos, which had a population of nearly 40 animals in 1992, lost four to poachers in the fiscal year of 1992/3 (Martin & Vigne, 1995). In contrast, in 1994 and 1995 not one rhino was poached inside Chitwan and only one outside up to November (see Table 6). Similarly in Bardia, no rhinos were poached in the fiscal years 1994/5 and 1995/6 up to November 1995, although six had been poached in the previous two years (source: Department of National Parks and Wildlife Conservation). The decline in poaching is thus even more dramatic than for India. As for India, there are several reasons for this success in Nepal.

First and most importantly, by far, has been the larger budget allocated to intelligence gathering in 1994 and

Table 6. Number of known rhinos poached in and around Royal Chitwan National Park, Nepal.

Year	In Royal Chitwan NP	Outside Royal Chitwan NP	Total
1992	17	1	18
1993	5	4	9
1994	0	1	0
1995*	0	1	1

* up to mid-November

Source: Department of National Parks and Wildlife Conservation

1995 for Royal Chitwan National Park than previously. From 1991 to 1993 the annual average amount of money spent paying individuals on a regular basis to collect information and for rewards to informers around Royal Chitwan National Park was \$1,359; the figure for the following two years was \$6,041 per annum, over four times as much. Most of this money came from donations from foreign tourists who visited Chitwan's Tiger Tops Jungle Lodge. This money was collected by Nepal's branch of the International Trust for Nature Conservation (ITNC) (Charles McDougal, tiger researcher, pers. comm., 1995). The money was given to three people: the Chief Warden of Royal Chitwan National Park and the District Forest Officers (DFOs) of Chitwan and Nawalparasi (which both border the Park) to pay the informers (McDougal, pers. comm., 1996). The National Parks Department does not have a budget for intelligence funds due to the difficulties that would be involved in accounting for the money officially. From 1991 to November 1994, ITNC raised \$15,884; about two-thirds was handed out as reward money and one-third for regular salaries to informers. These funds helped the authorities make many arrests. In 1994 14 rhino poachers and two tiger poachers were caught. In 1995 there were 10 seizures of tiger bones and skins along with 28 arrests of poachers and traders. There were also two rhino horn seizures with about six people arrested in 1995 (McDougal, pers. comm., 1996). Additionally, four people were arrested in 1995 for selling fake rhino horns (Ramprit Yadav, Chief Warden, Royal Chitwan National Park, pers. comm., 1995).

Second, the District Forest Officers, who have jurisdiction over wildlife outside the parks, have become more active against the rhino horn trade in some key areas. The DFOs around Chitwan, Bardia and in Kathmandu have been using intelligence information more effectively and have been more aggressive against rhino poachers and traders. Chitwan District's DFO, Y.B. Thapa, even arrested a former Assistant Minister attempting to sell a rhino horn in Bharatpur town, just north of Royal Chitwan

National Park, in 1995. After extensive bargaining, when the former Assistant Minister was going to accept the equivalent of \$2,000 for his 350g horn (the equivalent of \$5,714 per kilo), he was arrested and put into jail for three months (Thapa, pers. comm., 1995). In late 1995 the Chitwan District DFO had 54 armed guards, 60 forest guards, 25 rangers and four assistant forest officers to protect the forests and wildlife in his district. In November 1995, there was a shortage of staff, however, as eight armed guards were sent on training exercise, three were transferred, and a further three resigned. Poachers then shot a rhino 10km north of the Park boundary, the only poached rhino in 1994 or 1995. The DFO found the carcass a few days later with the horn removed. Staff took the nails and seven sections of skin for storage. The DFO then allowed local people to help themselves to the carcass, an important measure to improve Park relations with neighbouring vil-

Photo credit: Esmond Martin



Just outside Royal Chitwan National Park in Nepal are community tree plantations for furniture-making and for fodder. To prevent rhinos from entering this particular plantation, a boundary trench 75cm deep, supported at intervals with wooden beams, has been constructed.

lagers. About 45 men and women took the meat, blood, urine and remaining skin, and eventually everything was taken. A few days later, however, a villager ended up in hospital with food poisoning from eating the decaying meat (Thapa, pers. comm., 1995).

Third, there has been increased police help. The DFO in Kathmandu with the police intercepted many illegal wildlife products in 1994 and 1995, including 11 leopard skins, a tiger skin, a rhino head and one rhino horn.

Two fake rhino horns made out of water buffalo horn and a fake tiger skin made in India from cow and goat skins were also impounded. Several arrests were made (G.P. Bankota, DFO for Kathmandu, pers. comm., 1995).

Fourth, harsher sentences have been introduced. Penalties for rhino poaching increased in 1993 to a maximum of 15 years in jail and a 100,000 rupee fine (about \$1,850 in late 1995). Unlike in India, these penalties are enforced and poachers are often jailed for a long period.

Fifth, park management in Chitwan and Bardia has improved, with a significant increase in patrol work. NGOs helped to establish two anti-poaching units in Chitwan and one in Bardia from 1993 to 1995. ITNC donated \$5,365 to Chitwan's units and WWF Nepal gave \$11,435 for all three units during this period (Ukesh Raj Bhuju, WWF Nepal, pers. comm., 1995). As well as these new anti-poaching units, the army based inside Chitwan and Bardia has been patrolling more frequently, and both patrol now at night, as well as in the day, concentrating their efforts on areas susceptible to poachers, such as the western side of Chitwan.

Sixth, there has been adequate funding for the parks. In 1993/4 Chitwan's total government budget was the equivalent of \$804,457 with the army receiving 65% of this. However, the full costs of the army are not covered by the Department of National Parks and Wildlife Conservation and therefore the real Park budget is higher. For 1995/6 Chitwan's estimated government budget was \$879,620, including the army's share presumed to be still about 65%. If one adds contributions from NGOs, the total budget for Chitwan comes to about \$900,000 or \$966 per km². This is quite adequate for the Park which is more than twice the size of India's Kaziranga National Park. With competent senior officials to manage Chitwan and its finances, it was possible in 1994 to buy new anti-poaching equipment such as vehicles, radios and tents. However, with the growing human population around Chitwan and Bardia, poaching pressure will probably increase, and more effort will be needed to protect the rhinos in the future.

CONCLUSION

The conservation of the greater one-horned rhinoceros in India and Nepal has been a success for many years with the total population steadily growing. The main reason is that government budgets for rhino areas have been over ten times higher on average than those in Indonesia, Malaysia and Vietnam. The large budgets have enabled sufficient manpower for patrol work, up

to one man per km², one of the highest for a rhino protected area owned and managed by a government anywhere in the world. The park budgets for India and Nepal's rhino areas have remained on average stable from 1993 to 1995 when corrected for inflation. On the other hand, there has been a recent big increase in the amount of money spent on intelligence gathering. This is therefore the main reason for the sharp reduction in poaching in 1994 and 1995 in both India and Nepal. Combined with this, Park management in the key rhino areas has improved and government officials have been more active in arresting poachers and traders. By contrast, Indonesia has essentially no intelligence system and officials know extremely little about Sumatra's poachers and the rhino horn trade to the detriment of the rhinos which have been steadily decreasing in numbers in recent years.

Nepalese and Indian wildlife officials have demonstrated that the most cost-effective method of saving rhinos is to spend money on an efficient intelligence network. In Royal Chitwan National Park less than one per cent of the total budget was spent on informers in the mid-1990s, yet this tiny amount was effective in catching and deterring rhino poachers. Officials trying to protect rhinos in other countries should also allocate money for an efficient intelligence gathering network and for more manpower with good leadership in the field. It would be encouraging if other countries could follow Nepal and India's example.

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