

Global lessons from successful rhinoceros conservation in Nepal

Achyut Aryal^{1,2,6}, Krishna Prasad Acharya^{3*}, Uttam Babu Shrestha⁴, Maheshwar Dhakal³, David Raubenhiemer⁵, Wendy Wright⁶

¹Charles Perkins Centre and School of Life and Environmental Sciences, Faculty of Science, The University of Sydney, Sydney, Australia.

²Department of Forestry and Resource Management, TOI-OHO MAI Institute of Technology, Rotorua, New Zealand.

³Ministry of Forests and Soil Conservation, Kathmandu, Nepal.

⁴University of Southern Queensland, Toowoomba, QLD 4350, Australia

⁵Institute for Agriculture and the Environment, University of Southern Queensland, Toowoomba, Australia.

⁶ Faculty of Science and Technology, Federation University, Australia

***Corresponding Author:** Krishna Prasad Acharya; Ministry of Forests and Soil Conservation, Kathmandu, Nepal:

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Global populations of rhinoceros have declined alarmingly, from about 500,000 at the beginning of the 20th century to 29,000 in 2016, largely due to an escalation of poaching for

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rhinoceros horn (Traffic 2016; Biggs et al. 2013). The current global rhino population is comprised of three Asian Species and two African species, the latter located in South Africa, Kenya, Tanzania, Namibia and Zimbabwe,. In Africa, the Southern white rhinoceros population is estimated at 20,700; and there are estimated to be around 4,885 black rhinoceros. The greater one-horned rhinoceros, found in Nepal and India, has a population of approximately 3,555. The other Asian rhino species are confined to Indonesia and have much lower numbers; there are fewer than 100 Sumatran rhinos and only 58-61 Javan rhinos (Save the Rhino 2016a).

The number of African rhino killed by poachers in the last ten years is estimated at 5,957 (Traffic 2016; Emslie et al. 2013; Poaching fact2016), about 1,338 of these were taken in 2015, a year in which the highest number of rhino were taken since the late 1980s (Traffic 2016; Gaworecki 2016; Figure 1). At current poaching rates, Africa's rhino populations may be extinct within 20 years (Di Minin et al. 2015). The Sumatran and Javan rhino populations continue to decline due to habitat destruction, poaching and inbreeding (Save the Rhino, 2016b) pushing them to the verge of extinction.

In sharp contrast, populations of the greater one-horned rhinoceros (*Rhinoceros unicornis*) in Nepal and India are increasing, providing a source of optimism for rhino conservation. Numbering only 200 individuals in the late 19th century, the combined Indian and Nepalese population of this species has increased 17-fold (Subedi et al. 2014; Talukdar et al. 2008; WWF 2016a). In India, four key protected areas (Manas, Orang, Pobitora and Gorumara) celebrated a zero poaching year in 2015; and poaching in Kaziranga National Park, Assam, home to more than 2,401 individuals, has also dropped to a historic low. (Cedric et al. 2016; Das et al. 2015; Lopes 2014; WWF 2016b; Esterman 2016). Rhino conservation has been particularly successful in Nepal. In 2016, the Nepalese government announced its fourth year of zero poaching (Acharya 2016) and a 21% increase in rhino numbers (from 534 in 2011 to 645 in 2015) has been observed (DNPWC 2015).. Here, we consider two primary factors that have been integrated to achieve success in rhino conservation in Nepal: a) institutional and legislative changes allowing strict enforcement of laws; and b) effective involvement of local communities. These may provide lessons for rhino conservation elsewhere.

Institutional and legislative changes

Nepal has adopted tougher penalties for poaching and has streamlined its judicial system in relation to poaching and wildlife crimes. Nepal's conservation policy now provides park authorities with special judicial powers, including the power to issue fines and imprison wildlife criminals (Martin et al. 2013; Acharya and Kandel 2012).. This change in conservation policy has resulted in increased arrests of alleged rhino-poachers, faster prosecution of cases, hence much more effective and efficient control of rhino poaching. In contrast, the number of rhino poaching arrests in South Africa has declined from 2010 to 2013 (Mongabay 2016); and in Mozambique, there are no strict penalties for rhino poaching or possession of rhino horn and poaching is considered as a misdemeanour (Save the rhino 2016).

Nepal also established the National Wildlife Crime Control Coordination Committee (NWCCCC) in November 2010; along with a central level wildlife crime control bureau (WCCB), including 16 district level cells (DNPWC 2013; WWF 2015). The NWCCCC has facilitated, coordinated, and improved the sharing of intelligence concerning poachers and smugglers; and implemented on-ground anti-poaching operations and law enforcement. This has enabled the Nepalese police to infiltrate networks of criminals, resulting in the arrests of over 2,400 people under Nepal's National Parks and Wildlife Conservation Act, 2009 (DNPWC's official Record 2016). Similarly, government has established South Asia Wildlife Enforcement Network (SAWEN) to control trans-border poaching issues.

Community involvement

The involvement of military personnel, training, technologies and partnerships in the pursuit of conservation efforts is often criticized (Lunstrum 2014). This model of 'green militarization' has achieved short-term success in lowering the intensity of poaching in high pressure areas in India (Duffy 2014). In Nepal, effective local community involvement is being used alongside the anti-poaching efforts of the authorities with great effectiveness. A key to Nepal's conservation success is the involvement of local communities who perceive benefits to their communities from conservation outcomes. Nepalese park authorities provide about 33% of park income to adjacent rural communities. Local management committees can expend these monies for conservation and development initiatives (DNPWC, 2016).

In South Africa, government programs and social services in areas (eg. Kruger National Park) where rhino populations remain high, are lacking and the relationship between local people and the park authorities can be acrimonious (Froelich 2016).

Challenges

Despite Nepal's success in combating poaching, rhino populations continue to be threatened by increasing human population, unabated habitat loss, and rapid infrastructure development in and around rhino habitats. In 2001, the Government implemented a corridor management programme, Terai Arc Landscape (TAL) (WWF 2002), to support habitat connectivity for rhino and tiger populations, but the effectiveness of these corridors remains unknown.

Rhinos in Nepal and India must also contend with the invasive bittervine (*Mikania micrantha*) which has adversely reduced the quality of rhino habitats. This weed has rendered 44% of former habitat in Nepal unsuitable for rhino (Murphy et al. 2013), forcing them to move outside protected areas where there is a risk of conflict with humans. As recently as 2015, a rhino was killed by local people following an incident of crop raiding (The Independent 2015; Nagarik News 2015). Furthermore, reduced connectivity between rhino populations has led to inbreeding and reduced genetic diversity. Attempts to address this by translocating animals from Chitwan National Park, the major habitat of Nepalese rhino with population of 605 (DNPWC 2015) to Bardia National Park, have not proven successful, largely due to a breakdown in the capability of government conservation agencies during a period of political instability (1996-2006). Between 1986 and 2003, 87 animals were translocated to Bardia. By 2006, large losses of rhinos due to poachers had occurred; 37 were lost in 2002 alone. A recent census recorded only 29 rhinos in Bardia (DNPWC 2015; Miya and Khatiwada 2016).

Conclusions and Lessons for global rhino conservation

The first of four zero-poaching years for rhino in Nepal, 2011, can be regarded as a landmark in Nepal's conservation history. Three further is a remarkable record in the face of global increases in poaching and illegal trade. Multiagency partnerships which include local communities, with effective coordination, communication, and leadership at a central level, backed by strong legislation and effective enforcement are key aspects of Nepal's successful

approach to rhino conservation. These are backed up by the communication of positive outcomes from successful wildlife conservation for local people, and their active involvement.

. There is a clear need for a collaborative international approach to reduce poaching of rhino and trading of rhino horn by enforcing national and international laws, sharing intelligence and experiences, fostering trans-border planning and linking existing initiatives. Although the political and conservation contexts may differ between Asia and Africa, the rhino-range countries of these two continents share the responsibility for conservation of these iconic animals.

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Figure 1. Comparison of rhino poaching in Nepal and Africa.

