



# Policy and management actions that resulted in curbing rhinoceros poaching

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## Abstract

1. Nepal almost eliminated poaching of the greater one-horned rhinoceros *Rhinoceros unicornis* over the past decade, although poaching of other rhinoceros species remains a major problem in other Asian countries, as well as in Africa.
2. It is important to understand the processes leading to declines in poaching in Nepal that may provide insight into possible anti-poaching interventions in other parts of world.
3. We argue that coordinated actions that led to (a) strengthened institutional mechanisms, (b) improved community participation and (c) enhanced interagency coordination all focused on dismantling illegal trade networks contributed to curbing poaching in Nepal.
4. The Government of Nepal (GoN) created a new institutional mechanism both at central and district levels aimed at formulating policies and collaborating with enforcement agencies. Security agencies (Nepal Police and Army) were given responsibilities in and around rhinoceros habitat, and local citizens, mostly youths, were involved in surveillance and reporting of poaching activities. Targeted arrests and prosecutions were carried out that resulted in much higher conviction rates than previously.
5. *Synthesis and applications.* Nepal's achievement in curbing rhinoceros poaching is a result of the collective and coordinated action of multiple stakeholders. Interagency coordination brought together the strength of each stakeholder, making it possible to fill critical gaps in anti-poaching campaigns. There is a need for continued engagement of local communities, interagency cooperation and better training of law enforcement staff to sustain past achievements.

## KEYWORDS

conservation action, conservation challenges, human-wildlife, Nepal, success story, wildlife poaching, wildlife trade, zero poaching

## 1 | BACKGROUND

Despite efforts in averting biodiversity collapse, many species are threatened with extinction due to human activities

Ramesh Kumar Thapa and Kamal Jung Kuwar recently retired from the government service.

(Ripple et al., 2015). Wildlife poaching in combination with habitat loss have driven large-bodied mammals into unprecedented levels of extinction risks (Baker et al., 2013; Benítez-López et al., 2017). Reversal of species declines requires efforts at local, national and international levels with a high level of coordinated conservation actions. This is especially true in biodiversity-rich but

resource-deficient countries such as Nepal (Cooney et al., 2017; Lawson & Vines, 2014). Nepal has made major noteworthy achievements in managing and expanding its protected area system, although some gaps remain (Paudel & Heinen, 2015), and in restoring many wildlife populations over the past several decades (e.g. Heinen, Baral, Paudel, & Sah, 2019; Wikramanayake et al., 2011). The rhinoceros population, almost completely eliminated by the 1960s (Acharya, 2016), made a remarkable comeback, then declined in the early 21st century, and has since rebounded over the past decade. What factors caused the current decrease in poaching remain a matter of discussion and some debate.

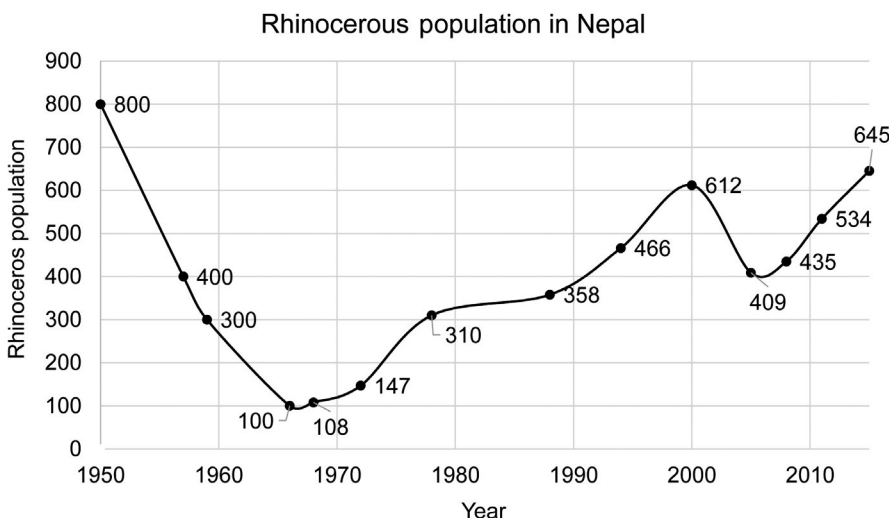
Greater one-horned rhino *Rhinoceros unicornis* is among one of the five surviving species of rhinoceros in the wild, the others being: Javan rhino *Rhinoceros sondaicus*, Sumatran rhino *Dicerorhinus sumatrensis*, black rhino *Diceros bicornis* and white rhino *Ceratotherium simum*. They are found in isolated forests and grasslands surrounded by large human-dominated landscapes in North India and Nepal (Jnawali et al., 2011), but were once distributed across large continuous forests of Bangladesh, Bhutan, Nepal and India along the Indus, Ganges and Brahmaputra River basins. Although rhinoceros populations are increasing in both India and Nepal, they are still at high risk due to limited available habitats, climate change-induced habitat change and poaching (Dinerstein, 2013; DNPWC, 2017). Poaching is a serious problem and continues to be a major threat due to well-organized covert trade networks and growing demand for horn used in traditional Asian medicine in rapidly growing affluence of China, Vietnam and other Asian countries (Amin, Thomas, Emslie, Foose, & Strien, 2006; Dongol & Heinen, 2012). Conservation practitioners and law enforcement agencies face major challenges to control such complex and clandestine trade networks. Against this background, a drastic reduction of rhinoceros poaching over the past decade in Nepal may provide practical insights into how conservation actions—priority-setting, monitoring, law enforcement and stakeholder involvement—contributed to such achievements.

## 2 | NEARLY COLLAPSED RHINOCEROS' POPULATION

In the lowland areas of Nepal, known as the *terai*, rhinoceros and other tropical Asian fauna once occupied vast intact forests along the entire southern border with India, and into the southern-most low hills and inner valleys of the Himalayas (Heinen, 1995). The area went through a rapid transformation with an influx of immigrants beginning in the 1950s due to malaria eradication, infrastructure development and government-sponsored resettlement programs (DNPWC, 2017; Paudel, Bhattarai, & Kindmann, 2012). This then led to rapid declines in large mammal populations, highly fragmented habitats, and faunal collapse in remaining habitats (Heinen et al., 2019). Consequently, the rhinoceros population in Chitwan valley plummeted from 800 to just 100 from the 1950s to the late 1960s (DNPWC, 2017). Chitwan National Park (CNP) was established in 1973, which effectively averted imminent extinction. The rhinoceros population in Nepal increased gradually until 2001, reaching a total of 612, but fell drastically afterwards, then again recovered (Figure 1). The pattern correlates with habitat loss and poaching, which was high during the Maoist insurgency that lasted until 2006, and the subsequent political transition in Nepal (Baral & Heinen, 2005; Subedi et al., 2013; Figure 1). As per the census held in 2015, there were 645 rhinoceros in Nepal distributed across the three populations (CNP)/Parsa National Park, Bardia National Park (BNP) and Shuklaphanta National Park (SNP), with 94% of them residing in CNP and adjoining areas (DNPWC, 2017).

## 3 | CURBING RHINOCEROS POACHING

As poaching was the major cause of rhinoceros mortality in Nepal, the GoN adopted an integrated strategy that included multiple actions specific to different stakeholders (Figure 2). Such concerted efforts brought together national and international conservation organizations (e.g. WWF, ZSL), protected area managers and park



**FIGURE 1** Rhino population in Nepal (1950–2015; DNPWC, 2017)

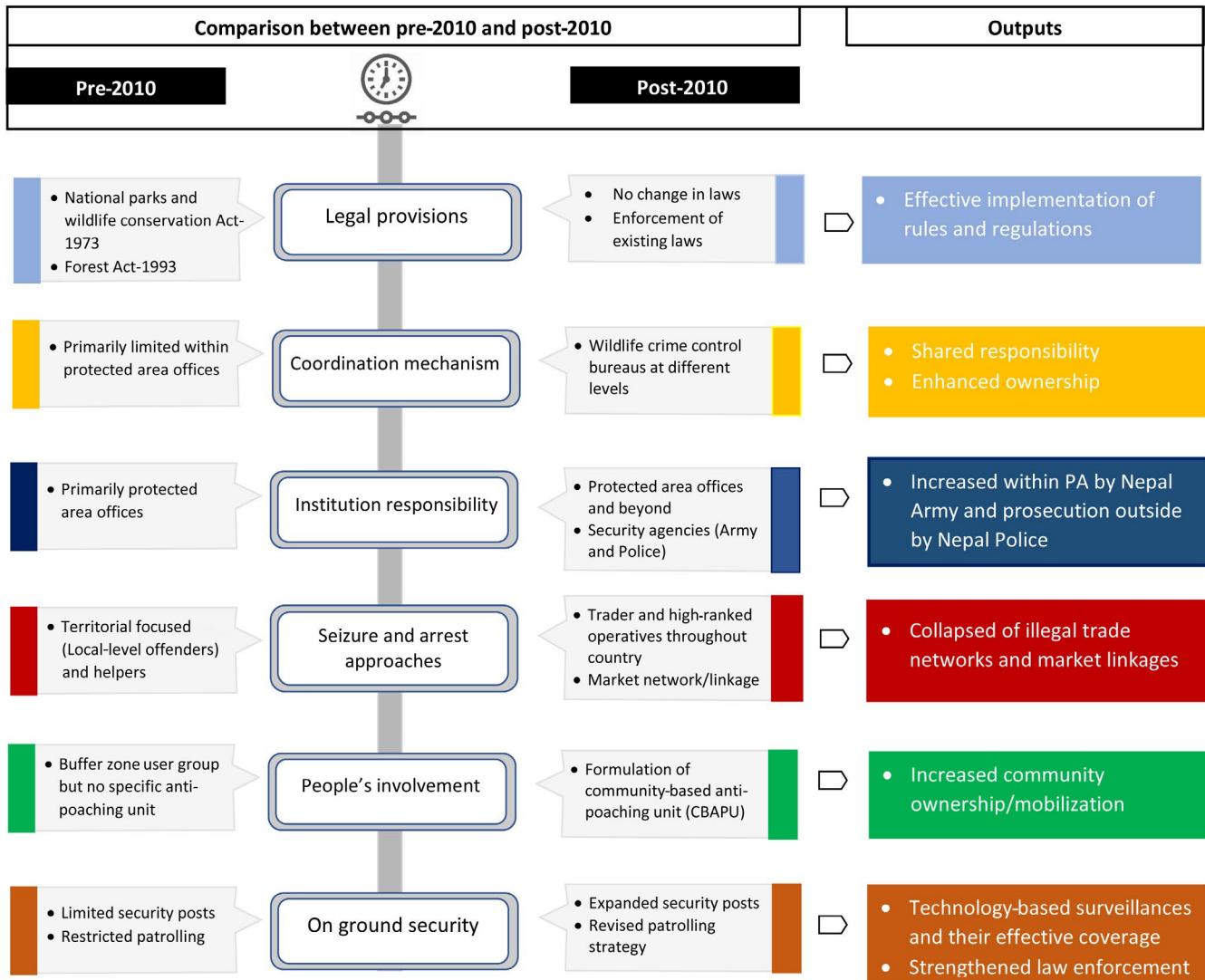


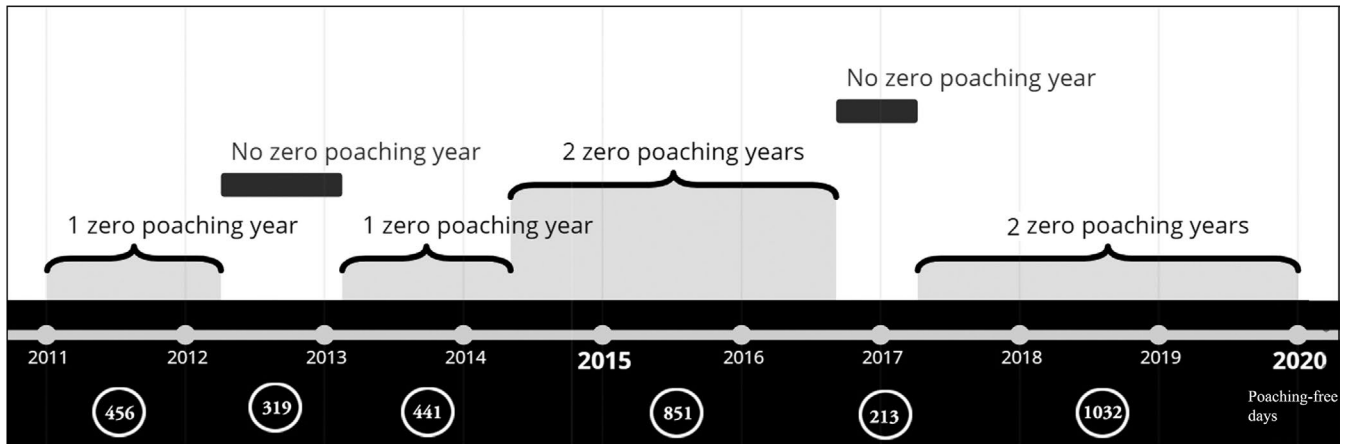
FIGURE 2 Conservation actions taken after 2010 that contributed to zero poaching of rhinoceros in Nepal

security personnel from the Department of National Parks and Wildlife Conservation (DNPWC), law enforcement agencies (e.g. Nepal Police, Nepal Army), custom officials, Department of Forest staff, judicial bodies and local people. High-level political involvement and leadership, involving the Prime Minister and the Minister of Forest and Environment (see Section 3.1 for details), were organized at the central level to forge meaningful and coordinated participation among the diverse stakeholders. Such efforts paid off with no cases of rhinoceros poaching for a complete 365-day period (3 January 2011 to 1 January 2012), a major landmark in the conservation history of Nepal (Figure 3). On 1 January 2012, the term ‘Zero Poaching’ year, defined as no evidence of intentional killing of rhinoceros by people for continuous 365 days, was proposed during a meeting of the National Wildlife Crime Control Coordination Committee, a high-level body created and chaired by the Minister of Forest and Environment, to celebrate the first full year of no rhino poaching in Nepal in an effort to sustain this conservation momentum. The CITES secretariat acknowledged this milestone with a certificate of appreciation.

Nepal successfully achieved six ‘zero poaching’ years over the previous 9 years (3,287 days; Figure 3). These outcomes are attributed to the following: strengthened central institutional support mechanisms, improved local community participation and enhanced inter-agency coordination at multiple levels, all simultaneously engaged in the singular goal of dismantling illegal wildlife trade networks from top to bottom.

### 3.1 | Strengthened institutional mechanism

The GoN created the Wildlife Crime Control Committees (WCCC), a new institutional mechanism, at central and district levels aimed at controlling wildlife-related crime in late 2010. The central level committee, the National Wildlife Crime Control Coordination Committee (NWCCCC), is chaired by the minister for Ministry of Forests and Environment. The members of that committee include secretaries of home, defence and finance ministries, chiefs of security agencies, and Director General of the DNPWC. The committee



**FIGURE 3** Timeline of zero poaching of rhinoceros in Nepal between 3 January 2011 and 2 January 2020. A 'zero poaching year' denotes a continuous 365-day period with no report of purposeful killing of rhinoceros by humans. Circled numbers indicate poaching-free days in respective years. Only four rhinoceros were lost to poaching in Nepal between 3 January 2011 and 2 January 2020

is tasked at formulating policies, legislation and directives to enhance coordination and collaboration among major stakeholders. At the operational level, the Wildlife Crime Control Bureaus (WCCBs) were established with both at central and district-level offices. The central level is comprised of heads of the DNPWC, the Department of Forests, the Department of Customs, the Brigadier General of Nepal Army, Deputy Inspector Generals of the Crime Investigation Bureau and the Armed Police Force, the Investigation Director of the National Investigation Department, and two representatives from NGOs working on wildlife conservation in Nepal. The DNPWC serves as the secretariat office. The responsibilities include coordinating and collaborating with enforcement agencies and monitoring poaching and illegal wildlife trade. District-level posts are comprised of officers responsible for law enforcement agencies with major responsibilities of controlling poaching and illegal trade of wildlife and their body parts. There are WCCBs in 26 districts. In addition, a National Tiger Conservation Committee was formed under the chairmanship of the Prime Minister, which provided much-needed coordination among diverse stakeholders and, particularly, law enforcement agencies such as Nepal Police/Central Investigation Bureau and Nepal Army. WCCB played a significant role in fostering cooperation, coordination and collaboration among relevant national agencies and stakeholders. Separate units within the Central Investigation Bureau of the Nepal Police and Armed Police Force were established to investigate and carry out covert operations on wildlife-related crimes. This strategy brought together capacity, expertise and skills among the diverse stakeholders to combat illegal wildlife trade.

### 3.2 | Improved community participation

Nepal has institutionalized community participation in protected area management and conservation by involving local communities living around the periphery of the protected areas, also known as buffer zone user groups (Sharma, 1991). These groups share

revenue (30%–50%) generated from protected areas (Allendorf & Gurung, 2016; Budhathoki, 2004), which has resulted in an increased sense of empowerment among local communities due to increased access to resources and enhanced community development, which in turn has increased their participation in and support of conservation-related activities (Heinen et al., 2019; Lamichhane et al., 2019). Since wildlife poaching and/or potentially suspicious activities is unlikely to remain undetected by local communities for long, active participation of people for informed vigilance can greatly help in providing intelligence for anti-poaching programs. The GoN integrated its community-based anti-poaching units (CBAPU) in buffer zone community forests with the aim of garnering local support for law enforcement and awareness-raising campaigns. There are currently 63 CBAPUs in rhino-bearing protected areas and 485 CBAPUs in areas outside the protected areas. Among them, 31 of those within protected areas and all CBAPUs outside them were established after 2010. Thus, there is now a great degree of integration of local communities within anti-poaching campaigns. Every year, CBAPU Day is celebrated on World Wildlife Day (3rd March).

### 3.3 | Enhanced interagency coordination

Government agencies legally mandated to conserve wildlife (e.g. the DNPWC) frequently do not have specialized capacity for carrying out criminal investigations and prosecutions. This is compounded by the fact that illegal trade networks operate through well-organized (frequently international) criminal syndicates well-beyond park boundaries. Control of poaching is one of the many tasks of park officials, which is basically entrusted to the Nepal Army within rhino-bearing protected areas and other national parks in Nepal.

The Nepal Police, in contrast, have resources and intelligence capacities, but wildlife crimes largely remain outside their purview due to limited knowledge and lack of specialized training in this area.

The WCCB effectively bridges these gaps via interagency coordination and harmonized actions between park officers, local communities and security agencies resulting in effective reduction of poaching on the ground.

### 3.4 | Break-down and dismantled trade networks

Rhinoceros poaching and trafficking include several actors in various hierarchies where two consecutive actors are only in contact in a chain at any one time, maintaining several firewalls to keep anonymity of the main actors. The actual crime is done at local levels by informers and shooters who get paid a very nominal sum. Once rhinoceros are killed, horns and other parts are picked up by the second tier of actors who supply poached horns to collectors, who reside in cities and are engaged in other, legal occupations in addition to poaching. In some cases, there may be two levels of collectors, the top one of which generally operates with an international network. The People's Republic of China is the main or, in some cases, the sole sink country for wildlife poached from other nations throughout Asia (Esty, 2005). Since rhino poaching and its trade is a high-risk/high-gain occupation, rather few people specialize in it. Once these few players are identified and apprehended, the entire trade network can collapse, at least temporarily. An aggressive arrest campaign was started in late 2010, which saw the arrests of approximately 3,000 people involved in all tiers of poaching and illegal trade of wild animals (K. P. Acharya, unpubl. data). Consequently, many of the most notorious wildlife criminals were brought under court imprisonment (see Appendix S1 for Supreme Court decisions). Nepal's national wildlife legislation—National Parks and Wildlife Conservation Act 1973 (NPWCA 1973)—imposes strict penalties on any person who kills or injures rhinoceros and sells, purchases, transfers or obtains rhinoceros horn or other body parts, with fines ranging from fifty to one hundred thousand Nepali Rupee (1 NPR = USD 114.19 as of 18 February 2020) or imprisonment ranging from 5 to 15 years, or both (Nepal Law Commission, 2020). Chitwan District Court, for example, convicted Rajkumar Praja including other 11 criminals with 15 years imprisonment and a 100,000 NPR fine (USD 875) in 2014. Mr Praja,

wanted for killing 15 to 20 rhinoceros in Nepal (Neme, 2014), was arrested by authorities in Malaysia with the support of Interpol (Anonymous, 2015). Currently there are 460 people in 31 prisons in Nepal who were convicted of wildlife-related crimes, which included 449 males and 11 females (Department of Prison Management, accessed on 26 February 2020).

The WCCBs played important roles in implementing prevailing laws effectively, and assisted in the prosecutions of apprehended criminals, many of whom had strong social, economic and political ties and influence. The arrest included, for example, Tanjing Nima Lama, who was supplied with a fake death certificate from a local hospital in an effort to escape justice (Anonymous, 2013). Special attention was given to identifying and arresting the most-wanted criminals in Kathmandu, the capital of Nepal, having international trade linkages. The strategy helped to break down market linkages as many wildlife criminals are now in jails.

## 4 | CONCLUSIONS AND THE WAY FORWARD

Control of rhinoceros poaching in Nepal is the culmination of the collective and coordinated actions of several stakeholders. Interagency coordination brought together the strengths of each stakeholder, making it possible to fill critical gaps in anti-poaching campaigns. Maintaining past achievements is difficult as circumstances described here may change quickly and new challenges, unforeseeable now, may evolve. The currently vacated niche of rhino poachers and illegal traders can be filled quickly by new recruits, therefore the vigilance of law enforcement and the arrest and expedient prosecution of wildlife crime must continue. We provided an overview at the national level, but circumstances leading to a zero poaching hold at district levels within Nepal as well at population levels in and around CNP, BNP and SNP (Table 1).

Until 1987, only CNP had a rhinoceros population. The GoN translocated 87 rhinoceros to BNP between 1986 and 2003, as well as four rhinoceros in 2003 and an additional five in 2017 to

**TABLE 1** Rhinoceros populations in Nepal and additional characteristics

Characteristics	Chitwan NP	Bardia NP	Shuklaphanta NP
Total number of rhinoceros	605	29	8
Number of poached rhinoceros (since 3 January 2011 till March 2020)	4	0	0
Core area	952.6 km <sup>2</sup>	968 km <sup>2</sup>	305 km <sup>2</sup>
Buffer zone	729.4 km <sup>2</sup>	507 km <sup>2</sup>	243.5 km <sup>2</sup>
Total number security personnel (Nepal Army)	~800	~600	~600
Total number of park staff	383	231	127
Buffer zone user committees	21 + 1 subcommittee	19	9
Community-based anti-poaching unit	22	19	9



SNP to create additional viable populations in Nepal. However, rhinoceros declined to 31 individuals due to heavy poaching in BNP during the armed Maoist conflict (1996–2006). At last count (2015) there were 645 rhinoceros in three populations in Nepal (Table 1). CNP has most, followed by BNP and SNP, but the number of security personnel, park staff and CBAPU per rhinoceros is just the opposite (Table 1). Four rhinoceros were killed in CNP over the past 9 years and none were killed in the other parks (Table 1). We recommend more attention and resources (e.g. park staff, security forces, funding for community development) in CNP. Restoration of grasslands—in decline due to natural succession via expanding woody vegetation and invasive plants such as *Lantana*—is equally important in maintaining rhinoceros populations (DNPWC, 2017).

The GoN must continue to dedicate itself to developing trained staff, who requires good pay grades and professional incentives in the form of training, logistics support and opportunities for career growth. The current pay-scale for wildlife staff is well below the regional average, and the job can be dangerous. Despite the successes described above, there is a need for heightened inter-agency coordination with more-specified responsibilities and with monitoring mechanisms to assess the quality of personnel and agencies to locate and improve upon any gaps in effectiveness. The WCCB has greatly contributed to better coordination among security agencies, protected area staff and non-governmental conservation partners. However, the bureau lacks the legal power to enforce its mandate; rather, it relies mostly on individual officers' abilities to control their own agencies and to network among other agencies.

The continued engagement of local communities is also critical to sustain past achievements. CBAPU are primarily youth-driven networks, and support for youth development is necessary. This would include, among others, support toward enhanced skill development, expanded educational opportunities and more sports and fitness programs given the nature of the work.

Finally, there is need for a well-coordinated strategic national anti-poaching plan subject to timely review and modification when situations change. Such a plan should include the use of modern technologies (e.g. surveillance cameras, mobile application for reporting, detection dogs, drones, real-time anti-poaching tags, etc.; O'Donoghue & Rutz, 2016). We reiterate that leadership is the most important at ministry, department and protected area offices, while continuing external financial and training support from international conservation communities and civil societies are equally important. We believe that the mechanisms, adopted by Nepal, that use local information by building community trust, interagency coordination and cooperation, enhanced law enforcement and better training of enforcement staff in criminal investigation and prosecution could be a model for many developing countries that face similar illegal wildlife trade issues.

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## AUTHORS' CONTRIBUTIONS

K.P.A. conceived the project and led the writing of the manuscript with inputs from P.K.P.; P.K.P. critically revised the manuscript and prepared figures. All the authors contributed data and gave final approval for publication.

## DATA AVAILABILITY STATEMENT

Data have not been archived because all data are available in the article.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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