JOURNAL OF INTERNATIONAL WILDLIFE LAW & POLICY
https://doi.org/10.1080/13880292.2022.2124609

Endangering the Endangered: The Poaching and Conservation Conundrum Facing the Greater Indian One-Horned Rhinoceros in Kaziranga National Park, Assam, India

Dilip Gogoi[a] and Biplob Gogoi[b]

[a]Department of Political Science, Cotton University, Guwahati-785001, Assam, India.; [b]Department of Political Science, Debraj Roy College, affiliated to Dibrugarh University, Golaghat-785621, Assam, India

ABSTRACT

The Kaziranga National Park (KNP), a World Heritage Site in the state of Assam, India, represents an area of unique importance to global rhinoceros conservation. It is home to the world's largest population of the famous black Asiatic one-horned rhinoceros, which remains an endangered species, and one that has been closely threatened with extinction. This article explores the conservation strategies for the great endangered Indian one-horned rhinoceros in Kaziranga by situating it in a regional spectrum of conservation and regimes of ecological governance. It considers the crucial issue of rhinoceros poaching and the current anti-poaching mechanisms in KNP in the light of global wildlife conservation efforts and domestic anti-poaching mechanisms in India. It further identifies the gaps between policy formulation and implementation of conservation strategies regarding the rhinoceros of KNP, a species that holds a unique geopolitical importance, both in the global context of the conservation of endangered species generally, and more locally as the national symbol of the state of Assam, India.

1. Introduction

While many animals have become extinct throughout the previous centuries, a growing number of long-standing species, such as the rhinoceros, are becoming increasingly threatened by modern conditions. Scientists remain apprehensive about a possible sixth mass extinction of species, with concerns raised over the environmental vulnerabilities facing mega-herbivores like the rhinoceros, as were evident in the earlier events of mass extinctions that had begun in the late Pleistocene era itself. Kaziranga National Park (KNP) of Assam, India, recognized as a world heritage site

CONTACT Biplob Gogoi biplob.edu1@gmail.com Department of Political Science, Debraj Roy College, affiliated to Dibrugarh University, Golaghat-785621, Assam, India

by UNESCO, presents a unilinear thread of accomplishments in bringing the one-horned rhinoceros back into existence from the threshold of extinction and in buttressing a viable rhinoceros population over the past century. This World Heritage Site remains as one of the few protected areas in which the population numbers of the greater Indian one-horned black rhinoceros have managed to rebound. This article examines the present conservation strategies for the Indian one-horned rhinoceros and its protection regime in Kaziranga. It explores the foundations of rhinoceros conservation against the backdrop of increasing poaching activities in KNP and analyses the impact of this on species conservation. The study further examines the mechanism for rhinoceros protection in KNP and identifies the gaps between policies and practice. It also considers how effective strategies for the enhanced conservation of the one-horned rhinoceros could be further developed.

2. Methods and Materials

This article adopts an interdisciplinary approach, alongside qualitative and quantitative analysis based on empirical evidence, gathered from the personal observations and interviews, as well as sources available in the public domain. The study begins by exploring the historical roots of the ecological conservation and governance of Kaziranga National Park from the colonial era to the present. It examines the existing global norms and domestic Acts (both local and national laws) relating to wildlife crime and their application in KNP, with special reference to rhinoceros protection. To fully understand the extent and dynamics of the problem of rhinoceros poaching, the authors undertook extensive interviews with police and forest officials, local communities, wildlife experts, conservationists, international non-governmental organizations (INGOs), and local NGOs working in the field, state intelligence and investigative agencies, and lawyers and judicial officials in the district of Nagoan, Golaghat and Sonitpur, Assam.

3. Historical Roots of the Indian Rhinoceros and Its Conservation in KNP

The Eocene era, approximately 50 million years ago, revealed the emergence of a wide variety of mammals, of which relatively few species were able to survive and evolve through to the present day.[1] Several unearthed fossilized remains of previous life belonging to the middle Pleistocene era

[1]F. Lacombat, The Evolution of the Rhinoceros, in Save the Rhinos: EAZA Rhino Campaign 2005/6 46–49 (R. Fulconis ed., European Association of Zoos and Aquaria, 2005).

testify to the fact that the Rhinocerotidae, the ancestors of today's surviving rhinoceros, emerged in the same age and had developed into a variety of groups of sub-species towards the end of that era.[2] Some 2.5 million years ago the first sub-species of one-horned rhinoceros emerged in the forested habitats of Siberia, Russia, and Germany and is considered to have preceded the arrival of the Indian one-horned rhinoceros, which later made inroads into the fertile grasslands, wetlands, and riversides of the Indo-Gangetic and Brahmaputra Basins and neighbouring Nepal, and crossed across the Indo–Myanmar border to enter into Bhutan and neighbouring areas.[3] Almost five thousand years ago, in the Mohenjodaro era, the Indian rhinoceros inhabited the plains of West Sindh province, which extended up to the northwest of Peshawar in today's Pakistan.[4] By the end of the twentieth century the Indian rhinoceros, with its fragmented population, became confined to the Terai Grasslands of Nepal, northern regions of Indian states like Uttar Pradesh (UP), Bihar, and Bengal, and forested tracts of Assam like Kaziranga, Manas, Pobitora, and Orang, prompted by a variety of factors including poaching, environmental change, habitat erosion, water and soil pollution, and population implosion.[5] The Indian one-horned rhinoceros found in Kaziranga National Park is now one of the rare five existing sub-species of rhinoceroses, with the other four being the African black two-horned rhinoceros, the African white rhinoceros, the Javan small one-horned rhinoceros, and the Sumatran two-horned rhinoceros.[6]

Kaziranga (Figure 1) was first transformed into as a reserve forest in 1908 to protect the great Indian one-horned rhinoceros and other wild animals and was declared a National Park in 1974 by the Government of India. It is now designated as a World Heritage Site by UNESCO and it has an impressive, yet also disturbing, conservation history. In fact, "Kaziranga has been heralded as a success story in bringing the one horned rhinoceros from the brink of extinction and building up a viable population during the last one century."[7] Kaziranga was started in 1905 as a

[2]W. A. Laurie, E. M. Lang and C. P. Groves, *Rhinoceros Unicornis. Mammalian Species*, 211 American Society of Mammologists 1 (1983).

[3]T. Foose and N. Van Strien, Asian Rhinos—Status Survey and Conservation Action Plan (IUCN, 1997).

[4]E. P. Gee, *The Great Indian One-horned Rhinoceros,* 5 Oryx 224 (1952).

[5]A. U. Choudhury, *Distribution of Indian One-horned Rhinoceros*, 12 Tiger Paper 25 (1985).

[6]L. N. Sangmo et al., eds., National Study Book of One Horned Rhinoceros (Rhinoceros Unicornis) (Third Edition, Wildlife Institute of India, 2016).

[7]Report of The Rhino Task Force (2015), submitted to the National Tiger Conservation Authority (2015), Government of India.

game reserve by the then British Viceroy Lord Curzon to guard and protect an approximate 100 individuals of the great Indian one-horned rhinoceros, along with some other endangered wild animals. A few leading Assamese intellectuals like Pitambar Dev Goswami (1885–1862) also made use of legislative assembly and the vernacular press to create social pressure, which played a vital role in changing the official stance of the colonial government towards wildlife.[8] Kaziranga was declared a "game reserve" in 1908, which meant that "privileged hunting" for colonial officials, European planters, local Assamese elites, and the conservation programme coexisted inside the reserve.[9]

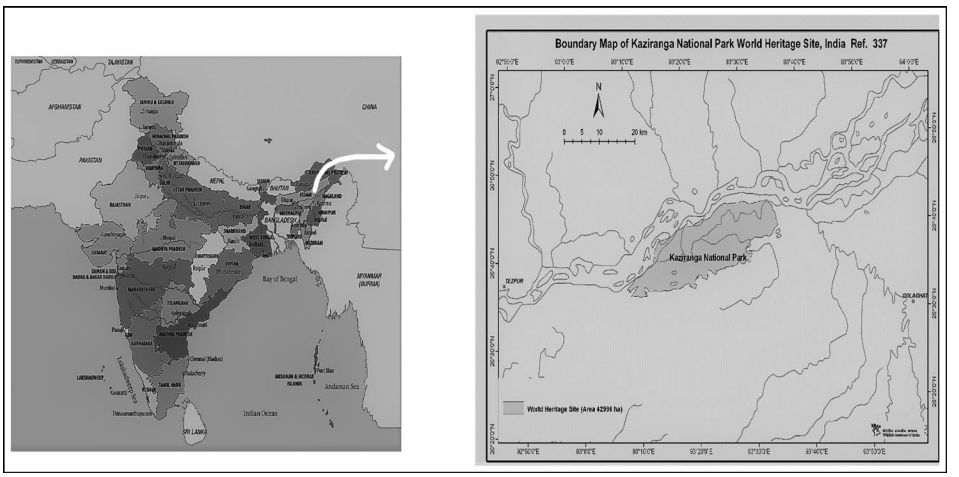

Figure 1. Political map of India showing the location of the Kaziranga National Park, Assam, India.[10]

It was relabeled as a game sanctuary in 1916, following which the twin objectives of conservation and maintaining a game reserve could be realized within the general framework of the forest department of the government. British Conservationists classified both the rhinoceros horn and ivory as "forest produce," and poaching and the collection of forest produce in any reserved forest became a criminal offence. In the post-independence period, the game sanctuaries came to be known as wildlife sanctuaries and the one-horned rhinoceros became a state symbol in 1948, lending much-needed political momentum towards reconciling Assamese national

[8]See further A. Saikia, *The Kaziranga National Park: Dynamics of Social and Political History*, 7 Conservation and Society 113 (2009).

[9]Id. at 115.

[10]Adapted from the UNESCO World Heritage Centre site, https://uhc.unesco.org.

identity and the KNP. The next decades saw a coalescence of nationalist sentiments towards rhinoceroses, following which Kaziranga was declared a national park in 1974 by the Government of India, pursuant to the Assam National Act Park of 1968.

At present, the accreditation of Kaziranga as a World Heritage Site allows it to benefit from conservation focus at the global, national, and local levels, which subsequently contributed to the securitisation of the entire region for "maximum protection" under the patronage of the state. At least 12 acts and legal safeguards, ranging from the Assam Forest Regulation of 1891 to the Biodiversity Conservation Act of 2002, provide the legal ambit of protection to the National Park. A sound management plan for Kaziranga (2003–2004 to 2012–2013) has been implemented at the behest of the state with defined objectives and strategies aimed at the protection of wildlife in the park. The park provides sanctuary to almost two-thirds of the total population of one-horned rhinoceroses in the world. According to the 1966 census, Kaziranga had only 366 rhinoceroses. After three decades, the censuses in 1999 and 2006 provided more optimistic results, as the number of rhinos had increased to 1,552 and 1,855 individuals, respectively. The Census in 2013 recorded 2329 individuals, and the last census of 2018 reported it as 2413, a marginal increase of 84 rhinoceroses over a period of 5 years (Figure 2).[11]

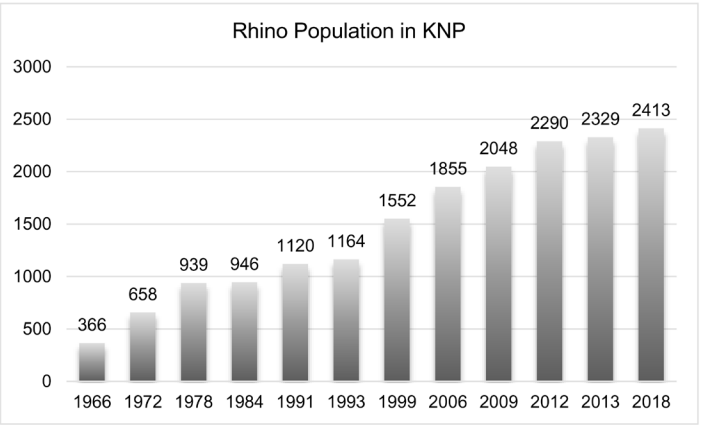

Figure 2. Population of rhinoceroses in KNP over the decades.[12]

[11]Performance Audit of Kaziranga National Park—Issues and Challenges Report (No. 3), of the Comptroller and Auditor General of India, Government of Assam (2014).

[12]Annual Report (2017–18), The Corbett Foundation, India; Detailed Report on Issues and Possible Solutions for the long-term protection of the Greater One Horned Rhinoceros in Kaziranga National Park, pursuant to the order of the honourable Gauhati High Court, 2014 prepared by M. K. Yadava, Director, Kaziranga National Park.

4. Locating the Problem: Recurrent Rhinoceros Poaching in KNP

Rhinoceros poaching emerged as an offshoot of the traditional hunting practices pursued by the privileged royal hunters and a few Assamese gentlemen in the early twentieth century, due to which extra-legal poaching camps emerged as early as the 1930s in the waterbodies inside the game sanctuary of Kaziranga. It was seen that the nexus between commercial capital and hunting brought in many local hunters into the sanctuary from different "tribes" and areas, and the integration of the practice of hunting into local livelihoods gave such practices a far more complex character. After the independence of India from British Rule in 1947, the rhinoceros was on the verge of extinction, and increasing pressure from global organisations forced the Assam government to introduce the Assam Rhinoceros Preservation bill in December 1954. The subsequent decades saw a crystallization of regional nationalistic sentiments around this "state heritage" and a clamour for creating a natural buffer against poaching; the local population even offering to act as forest guards.

Towards the end of the twentieth century, poaching had acquired a large international market base with concomitant increase in poaching in Kaziranga following the widespread decline of the rhinoceros habitats in Southeast Asia. Rhinoceros poaching has been on the rise due to a well-entrenched global market in rhinoceros horn, originating from superstitions, ritualistic practices, and certain ill-conceived reforms taking place in the countries of South East Asia and the Middle East. Myanmar, China, Taiwan, Thailand, Vietnam, and South Korea are known to be huge markets for the illegal trading in rhinoceros horns.[13] Moreover, rhinoceros horn is integral to societal religious rituals and traditional dance forms in the Middle Eastern nations of Saudi Arabia, United Arab Emirates (UAE), and Yemen; it is considered to contain aphrodisiac qualities helpful in promoting sexual potency. The Asiatic rhinoceros horn is known as the "fire horn" in Taiwanese and Chinese markets and the African rhinoceros horn as the "water horn"; these are clearly synonymous with widely held beliefs about their respective curative qualities. Countries like China, and Taiwan cherish some age-old beliefs about the rhinoceros horn, and every part of the animal's anatomy is believed to have medicinal values and to provide pharmacological ingredients for daily ailments—although these assertions have been dispelled by research showing that

[13]R. H. Emslie et al., African and Asian Rhinoceroses: Status, Conservation and Trade: A Report of the IUCN Species Survival Commission, African and Asian Rhino Specialist Groups and TRAFFIC to the CITES Secretariat pursuant to Resolution Conf. 9.14 (Rev.CoP.15); reproduced at http://www.rhinoresourcecenter.com/pdf_files/156/1560170144.pdf.

keratin, which constitutes the fibrous nasal bone of the rhinoceros horn, has no medicinal or aphrodisiac properties.[14]

The myriad conservation strategies and policies in KNP have nevertheless left remarkable loopholes in the conservation of wildlife and ecology of the Park. Publicly available statistics confirm that the park lost around 567 rhinoceroses to poachers between 1980 and 2005. Most of the poaching cases concerning rhinoceroses were recorded in between 1980 and 1997.[15] In more recent years, poaching trends have reduced dramatically, in the light of a major investigation by the Central Bureau of Investigation initiated by the Assam Government, against the backdrop of a massive outcry from civil society organizations and the Advocacy groups for wildlife protection in the state. Assam lost 40 rhinoceroses in the intervening period from 2010 to June 2012, although 41 were poached in 2013, the highest in a year.[16] However, there has been a decreasing trend, with 30 and 20 individuals taken in 2014 and 2015, respectively.[17] This has since dwindled further from 22 in 2016 to only 3 in 2019,[18] following concerted antipoaching efforts by the Assam government (Figures 3 and 4).

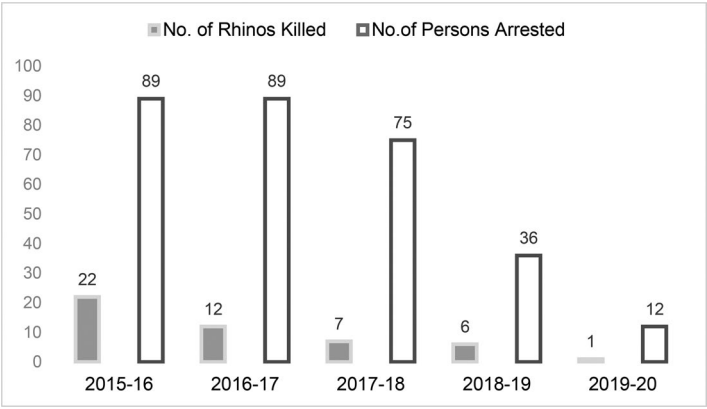

Figure 3. Total numbers of rhinos killed and persons arrested.[19]

[14]F. Patton, The Medicinal Value of Rhino Horn—A Quest for the Truth, reproduced at http://www.rhinoresourcecenter.com/pdf_files/132/1323815303.pdf.

[15]Report of the Comptroller and Auditor General of India, 2014.

[16]Report of CITES (Conservation on International Trade in Endangered Species of Wild Fauna and Flora) 2016.

[17]The Telegraph,12 September 2016.

[18]Forest Minister, Government of Assam's interview with IANS, as quoted at weather.com on 22 September 2020.

[19]The Times of India, accessed on 4 July, 2020.

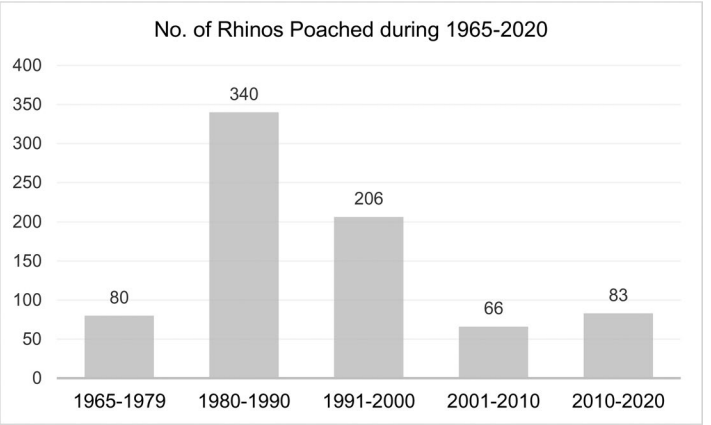

Figure 4. Rhinos poached during the last decades.[20]

4.1. The Background of a Poacher

Profiling poachers has always been a difficult task for the law enforcement agencies, as categorization in terms of race or of social or economic class is increasingly becoming difficult in the light of the various interests, individuals, or groups involved in poaching. A typical poaching gang usually involves three to five people, belonging to ethnic tribal groups like Nagas, Bodos, and the local Karbis.[21] The Nagas hail from the neighbouring state of Nagaland, and Bodos from the lower plain areas of Assam, while the Karbis are as locals familiar with the area and helpful in carrying provisions. The Nagas generally bring rifles from Dimapur, a trading town on the Assam–Nagaland border. However, others like Nepalese, Bhutanese, Assamese Hindus, Muslims, and local Mising tribals also account for a sizable percentage of the apprehended poachers.[22] Earlier, there were instances of involvement by outlawed Indian militant separatist outfits in the region, and many of the poachers were financed by opportunistic traders, particularly during periods of civil unrest, and might sometimes be helped by an unscrupulous employee of the forest department or local villager.[23]

[20]Report of the Comptroller and Auditor General of India (n 15).

[21]E. Martin, B. K. Talukdar, and L. Vigne, *Rhino Poaching in Assam: Challenges and Opportunities*, 46 Pachyderm 25 (2009).

[22]V. Menon, Under Siege: Poaching and Protection of Greater One Horned Rhinoceroses in India (Cambridge, TRAFFIC, 1996).

[23]A. Agarwal, S. Narain, and S. Sen, The Citizens' Fifth Report (New Delhi, Centre for Science and Environment, 1999).

(a)

(b)

Figure 5. (a, b) Poached rhinos, photographed by the first author in 2012.

The modus operandi of the poachers has generally been pursued through a syndicate-style organizational structure operating in tandem with local informers and supported through various agencies of financial and commodity transactions.[24] Poachers have clandestine camps at Dimapur in the neighbouring state of Nagaland, as well as along the riverine shores of Brahmaputra in the northern part of KNP, with a majority of the poachers using riverways as paths of travel and communication. The verification of the police sources of the state by the authors revealed a close association between these poachers and the extremist groups of the neighbouring locality

[24]A. E. Brener, An Anti-Poaching Strategy for the Greater One-Horned Rhinoceros in Kaziranga National Park, Assam, India (unpublished master's thesis, University of Calgary, 1998).

Table 1. Methods of Poaching

Shooting	Poachers are hired gunmen who operate as sharpshooters equipped with mostly illegal arms and supplied through syndicates organising such poaching from neighbouring states or countries. No particular preference for weapons can be observed, and they can range from country-made muzzle loaders, shotguns, and rifles to other semi-automatic weapons. However, during the last decade or so, maximum use of automatic weapons was made by the skilled poachers, well acquainted with camp staff movements.
Pit poaching	This is resorted to only in certain circumstances. A pit is normally dug, either lined with bamboo stakes or left unadorned, and is placed on a path in areas near defecating heaps, water wallows, and so on frequented by the rhinoceroses It is highly dependent on nature of the terrain and is generally not a preferred mode of poaching for those who have access to guns.
Electrocution	This is the newest and inventive killing technique mostly used by the poachers along a 25-km stretch of 11,000-volt line passing across the southwestern portion of the park since the 1990s. Poachers cut high-volage lines during load-shedding and lay them on beaten tracks frequented by rhinoceroses. Though this is stealthy in character, it is an indiscriminate method restricted in use to places with suitable powerlines only and hence relatively a less ofen used method of poaching.
Poisoning	This is a much less often used method, and to date no official records on the type and details of chemical poisoning have been available from the authorities. Reports suggest use of zinc phosphide, rat poison or pesticides on salt licks frequently used by rhinoceroses.

Table 2. Phases of Anti-Poaching Management

Pre-entry phase	Proactive action involving intelligence gathering; engaging local people through eco-development works, mass education drives and awareness campaigns in the fringe villages of park.
Post-entry phase	Reactive action involving operations by the staff with existing logistics of tracking down poaching operations and to input intelligence, alongside securing vital enforcement infrastructure (such as surface and radio communication, vehicles, boats surveillance facilities and weapons).
Post-exit phase	Investigative action and the prosecution of crimes committed by poachers; also involving effective coordination with other law enforcement agencies, i.e. police and task forces.

and other states of northeastern India, which facilitates the transborder supply line of rhinoceros horns from the border of Dimapur to Myanmar via Longua and Moreh of Manipur state. The Asian Rhino Specialist Group suggests that cross-border trade into Myanmar has become the primary route from Assam to the Kachin state of Myanmar and the Yunnan province of China to Southeast Asian countries, especially Vietnam.[25] This corroborates the historical evidence from the seizures of three one-horned rhinoceroses in Yunnan, China, in 2010–2011 and four one-horned rhinoceroses in the Muse Township, Shan state, on the Sino-Indian border.

4.2. Methods of Poaching

Four methods of poaching in KNP have been identified from the available reports and the authors' own observations during field investigations in the park with the forest officials and other stakeholders (Table 1).[26]

[25]Emslie (n 13).

[26]From the account of the authors' field investigation notes, 20192020. Similar findings are available in Brener (n 24) and Menon (n 22).

Table 3. Staffing of Personnel: Regular KNP Authority[27]

Posts	Sanctioned strength
Director	1
DFO/ACF	1
Range Officer	4
Deputy Ranger	7
Forester 1	45
Forest guards	212
Mahut	34
Driver	17
Game Watcher	58
Boatman	63
Others	70
Total	513

5. Anti-Poaching Mechanisms in KNP

A credible regime for protecting rhinoceroses demands a strong anti-poaching mechanism in place. It also requires a proactive management system to ensure that obligations to maintain an ecologically sustainable landscape and to protect rhinoceros habitats, as sanctioned by both global norms and state laws, are fully and effectively enforced. The current anti-poaching mechanism in Kaziranga has two main components. The first aims at active surveillance to track the movement of poachers, and the second at maintaining an optimum habitat in the form of ecologically secure grasslands for the rhinoceros.[28] Furthermore, an annual action calendar of the Kaziranga park authority presents the strategies and operational schedules for maintaining the bio-resources of the park and habitat of the rhinoceros and for taking stock of biotic pressures that affect these resources.

5.1. Anti-Poaching Management: Phases and Activities[29]

Box 1

Assam Forest Protection Force (AFPF): This force was created in 1985 under an Assam legislature act and has a total of 425 personnel, including CCF, Addl. CCF, CF, Commandant, Dy. Commandant, Company Commander, Platoon Commander, Havildars, and Constables. The force operates under the direct command of the Commandant subject to general supervision of the Forest Range Officers of KNP Authority.

Available Equipment and Arms: Elephants, country boats, speed boats, fibreglass boats, motor launchers, jeep, van, walkie-talkie, fixed radio transmitter, mobile radio transmitter, binocular, night vision, drones.

Arms (Old Type): 193 .315 and 164 .303 double-barreled guns, 10 revolvers, DBBL-41, SBBL-01. (New Type): 272 INSAS rifles, 91 Ghatak rifles, 954 SLRs, 133 12-bore pump-action guns, 20 9-mm pistols.

[27]Compiled by the authors from the field investigation notes, 2019–2020; see also *Report of the Rhino Task Force* (n 7) and Comptroller and Auditor General of India Report (No. 4) (n 15).

[28]This was confirmed to the authors by the park authority.

[29]From the authors' field investigation notes, 2019–2020.

The mobility of protective personnel is enhanced by a network of forest roads, such as the central gravelled road and fair-weather roads at the Kohora Range, Western Bagori Range, Eastern Agaratoli Range, and the Burapahar Range, as laid out under the 2002 Management Plan. The park has approximately 165 anti-poaching camps along the bank of the river Brahmaputra in the northern boundary, central portion, and southern boundary of the park, including two floating camps on the Brahmaputra River.[30] These camps are strategically located inside the park, with a small number on the fringe of the park to pre-empt incursion of poachers and to enable the staff to react promptly to react to poacher activities. The camps, which are mostly semi-permanent structures powered by solar-powered panels, serve as the smallest but most effective administrative units of surveillance. Further, the filing of a *Suo Moto* Public Interest Litigation (No. 66/2012) in its own court by the Guwahati High Court indeed facilitated many steps taken by the authorities, including the maintenance of existing facilities and the construction of new anti-poaching camps.

Elephants offer much-needed logistics for the transportation of supplies to camps during the monsoon season and for patrolling of inaccessible areas. The staff is equipped with very-high-frequency (VHF) transceivers, which are major means of communication for the exchange of information, while the foresters are provided with arms and mobile wireless stations, which helps to counter poaching activities. An electronic monitoring system installed in 2015 supplements the capacity of the watchtowers erected to monitor the movements of both animals and humans in the park[31]; some of these further serve as elephant-riding platforms for the staff and the tourists.

5.2. Present Limitations: Anti-Poaching Mechanisms in Kaziranga

There are several factors responsible for the current concerns over the conservation mechanisms for rhinoceroses in the KNP. The Rhinoceros Task Force Report 2015 identified several such lacunas in the present conservation strategy. Moreover, the earlier state government had adopted an ad hoc and indifferent approach towards protecting the one-horned rhinoceros and its habitat in the park. State government showed general apathy to providing timely support, compounded by a lack of political will to take up adaptive strategies while they were of utmost necessity.

[30]This was confirmed to the authors by the park authority during field investigations in 2019.

[31]Rhino Task Force Report (n 7).

Insufficient budgetary allocations and the poor financial condition of the forest department of Assam government also badly undermined efforts to secure sound conservation management in the KNP. A shortage of funds has further exacerbated these lacunae, and created additional difficulties, notably by ensuring that intelligence-gathering activities are inadequate, as well as ensuring a lack of maintenance for what are now rather dilapidated anti-poaching camps, and an inability to provide updated training in patrol skills or modernizing weapons and equipment. This has led to a discernible and consistent state of low morale within the government forces, leading to increased poaching and an inadequate response time to activities conducted by the poachers. Beyond these financial constraints, the entrenched involvement of armed insurgents and their ready supply of modern weaponry to local criminals for financial gain further provides added impetus to poaching activities.

An explosion of human settlements and populations in the fringe areas of the KNP has also served to sustain the rapid transformation in the land-use pattern in the vicinity due to increased commercial activities and construction work. These activities in the vicinity of the park have blocked the pathways and corridors connecting the park and its neighbouring forest areas. At the same time, the proposed donation of new areas of land from the state government to the park authority in order to expand the boundaries of the sanctuary also failed to materialize, due to legal complexities created by the existence of well-established settlers in these areas.

An absence of adaptive strategies in coordination among law enforcement agencies in the state and poor conviction rates of poachers and traffickers in the domestic courts are also significant shortcomings. The years following the implementation of legislative and administrative measures have resulted only in additional evidence that the regime for the protection of the KNP is ineffective one, with an increase in the poaching of rhinoceroses and an inability of the population dwelling on the fringe of the park to effectively intervene. Fringe villagers, who were so carefully organized and trained by the Indian Ministry of Environment and Forests through awareness and education drives, have taken relatively little interest in rhinoceros conservation, primarily because they are already living in conditions of financial precarity, given that the projected economic benefits of eco-tourism programmes and the "ethnic villages" established under the Eco Development Committees created at the behest of the state have also failed to materialize.

As the rhinoceros is the state's flagship symbol and Kaziranga is almost synonymous with the province of Assam, a significant connection can be seen between ongoing civil unrest and concurrent rhinoceros poaching in

the region.[32] Civil society and the educated urban middle class have lent their voice to the fight against rhinoceros poaching, but ultimately their support is motivated more by concerns for the preservation of a symbol of national pride than for the protection of nature. For the political parties, the rhinoceros became the election plank during a 2014 election campaign to draw in new political battlegrounds in the state, and for activist groups such as the All Assam Students' Union (AASU), Krishak Mukti Sangram Samiti (KMSS), and the Hindu nationalists, an anti-poaching ticket became a novel tool to articulate their own socio-political goals. The roles played by the stakeholders in the fight against poaching of the rhinoceros has, by and large, only substantiated the rising trend of utilizing ecological degradation as a metaphor for cultural degradation.[33]

6. Towards an Effective Conservation Policy: The Road Ahead

6.1. Revamping of Human Resource Management

If the rhinoceros conservation goals of Kaziranga are to be fully optimized, it will be necessary to completely revamp both the human resources and the physical infrastructure dedicated to this task. The numbers of anti-poaching camps need to be increased in the fringe areas of 110 villages with a population of 2.60 lakhs,[34] because trends in poaching showed that the poachers struck most frequently in these areas, taking advantage of a porous boundary, the shelter available in the villages, and a lack of cooperation between villagers and the wildlife enforcement authorities. The available manpower in terms of front-line staff also needs to be increased. Since the Assam Forest Reserve Forces lack absolute jurisdiction, due to the dual control of the forest range officers as well as their company commanders, this branch ideally needs to be merged with the wildlife wing currently under the control of the park authorities.[35] Appropriate training for the front-line staff and a steady flow of allotted funds for intelligence gathering need to be secured to boost the capacity of the existing personnel, who are already undermined by a lack of sophisticated weaponry and technology in comparison to the well-equipped poachers.

[32]A. A. Lopes, *Civil Unrest and Poaching of Rhinos in Kaziranga National Park, India*, 103 Ecological Economics 20 (2014).

[33]J. Smadja, *A Chronicle of Law Implementation in Environmental Conflicts: The Case of Kaziranga National Park in Assam (North-East India)*, (2018) 17 South Asia Multidisciplinary Academic Journal 1 (2018).

[34]Detailed Report on Issues and Possible Solutions for the long-term protection of the Greater One-Horned Rhinoceros in Kaziranga National Park, pursuant to the order of the honourable Gauhati High Court, 2014 prepared by M. K. Yadava, Director, Kaziranga National Park.

[35]Id.

Analysis of call data records (CDR), mobile tracking, and the use of drones ought to be put into extensive use to supplement the efforts of the forces. Intelligence-based enforcement needs to be put in place, which should be focused on inter-agency coordination and transboundary oversight, training for enforcement agencies, access to the data of mobile subscribers, DNA indexing of rhinoceroses so as to connect their horns with a broader DNA database, the realignment of anti-poaching camps, and the enhancement of infrastructure for effective river patrols in the north bank tributaries of the river Brahmaputra.[36]

6.2. Engagement of Stakeholders

The role of major stakeholders, such as the state government, local park authority, fringe dwellers, and third-party organizations, is of enormous importance in the fight against rhinoceros poaching. It is challenging for the government to ensure that the anti-poaching efforts of the authorities are able to overcome the legal problems raised concerning landownership that were generated by attempts to extend the boundaries of the national park. The Assam government has set up many forces (i.e., Assam Forest Protection Force, Anti-Poaching Task Force, Rhino Protection Force) in addition to the administrative and legislative tools being brought in to strengthen intelligence gathering and law enforcement in support of anti-poaching activities. In view of the steady multiplication of anti-poaching measures involving these law enforcement agencies, it is imperative that the state government recognize that an increasing militarization of the park does not undermine the spirit of conservation itself. Better coordination between the various stakeholders and the security forces is required in order to uphold an effective conservation strategy, which is missing at present.

Since wildlife crimes committed in the park have a transnational dimension, it is necessary to harness the assistance of global investigatory agencies such as the Central Bureau of Investigation (CBI) and Interpol for the prevention and apprehension of such crimes. Ultimately, there is a limit to what can be achieved on the ground in the KNP: Unless the wider transnational network of illegal trade in wildlife that fuels poaching activities in the first place is dismantled, the KNP authorities will continue to face extensive challenges in their efforts to protect these species. In this regard, the empowerment of the CBI by the state government in 2013 was a welcome step in investigating the international and interstate

[36]As suggested by the Rhino Task Force Report 2015 (n 7).

network of poachers. The establishment of the Anti-Corruption Cell to apprehend and prosecute wildlife offenders has also extended the powers of the present state government. Now a law passed by the State Government of Assam in 2010 under provisions of section 197(2) of the Criminal Procedure Code (CrPC) has endowed all forest officers and staff with immunity from prosecution with no government sanction.[37] Assam was the first state in India to introduce a legal step to pass the Assam Amendment Act, 2009, under the ambit of the Wildlife Protection Act, 1972, affirming strong punishments for poaching, involving a minimum of seven years of jail to a maximum of life imprisonment. However, this legislation can only achieve its desired results if the state police department gives priority to cases of wildlife crimes and increases rates of conviction of wildlife crime offenders.

7. Conclusion

Kaziranga represents a rare environment with moist, fertile grasslands and an aquatic terrestrial environment where mega-herbivore "eco-system engineers" such as the elusive rhinoceros find optimal habitats for themselves. At a time at which the dwindling ecosystem has been affected by invasive exotic floral species and compounded by a steady shrinkage of its core area over an extended period of time, the rampant poaching of rhinoceroses has rendered the expansion and protection of the fringe areas of the KNP an immediate necessity to secure grazing, breeding, and shelter grounds for the increased numbers of animals. The first effective synergy in regard to ecological governance in KNP was observed as a tripartite collaboration between the Assam government, World Wildlife Fund, and the International Rhino Foundation, following which a task force for the translocation of rhinoceroses within Assam, that is, between the three reserved forests of Kaziranga, Orang, and Manas, was formed in November 2005, aimed at the long-term growth of populations of the one-horned rhinoceros and the improvement of their habitats.

While the impacts of the COVID-19 pandemic seem to have brought about short-term disruptions to wildlife crime and wildlife trafficking worldwide, trade channels are likely to open up online or through related mechanisms.[38] A prelude to the possible future adaptive strategies in the KNP therefore may include the digitalization of anti-poaching activities,

[37]Order by the Governor Notification, Government of Assam, Environment and Forest Department. dated 14 July 2010.

[38]World Wildlife Crime Report, 2020 (Geneva, UNODC, 2020)

quite akin to the operation WILDNET-II undertaken by Wildlife Crime Control Bureau in November 2019 throughout India to unearth growing illegal wildlife trade on the Internet through social media platforms.[39] Moreover, further research is required to unearth the transnational dimension of the illegal trading of rhinoceros horn in the uplands of East and Southeast Asian regions. Without building an effective coordination and collaborative protection mechanism between the stakeholders of neighbouring countries, the prevention of such illegal wildlife trade will continue to remain a remote possibility. Therefore, a concerted strategy among the stakeholders, which is absent at present, needs to be effectively implemented to facilitate enhanced conservation of the endangered rhinoceros in the KNP. Such efforts would only serve to support the Indian Rhino Vision 2020 that aims at buttressing the population of rhinoceros in Assam, by promoting programmes to enhance and provide greater security to rhinoceros habitats, alongside the rehabilitation of rhinoceros populations in seven reserved forests of the state.[40]

[39]Wildlife Crime Control Bureau, India, Newsletter, *January–March 2021*.

[40]See further https://forest.assam.gov.in/information-services/indian-rhino-vision-2020-0.