

Jemy Sara Joy

Fostering Coexistence: Insights for the Future of Tiger Conservation in India

Abstract

The conservation of keystone species like the Bengal Tiger in India is crucial amidst global climate change and biodiversity loss. While Project Tiger¹ has achieved successes, challenges persist where tiger populations decline. This paper examines human-wildlife coexistence through case studies from India and Nepal, emphasizing indigenous communities' relationships with tigers and lions. The Mishmi people of Arunachal Pradesh exemplify deep kinship with Bengal Tigers, stressing the integration of place-based perceptions and indigenous knowledge in conservation. Similarly, Tharu people in Nepal's Chitwan National Park exhibit fine-scale spatial and temporal coexistence with tigers, supported by institutional backing for sustainable prey numbers and reduced exploitation. In Gujarat's Gir Forest, Maldhari people coexist with Asiatic lions, using adaptive measures like nighttime livestock corralling and mixed grazing herds to mitigate lion predation, and relies on government-given grazing rights and economic compensation in the event of cattle predation, highlighting the need for socio-economic support and institutional frameworks. Although focused on lions, this example is relevant to tiger conservation efforts, as both species are big cats with similar ecological

¹ Project Tiger, launched in 1973, is India's government-led initiative aimed at conserving the Bengal Tiger population by establishing protected reserves and combatting threats like poaching and habitat loss.

behaviors, providing valuable insights into human-wildlife coexistence strategies. Besides, addressing historical injustices, such as indigenous community displacement for conservation, is crucial. Trust-building and involving local communities in co-management are essential for cooperation between Adivasi and wildlife authorities. By respecting indigenous knowledge, providing socio-economic support, and involving communities in conservation, this paper advocates a holistic approach based on sustainable human-wildlife coexistence for tiger conservation in India.

Fostering Coexistence: Insights for the Future of Tiger Conservation in India

Introduction

The conservation of keystone species has become of paramount importance within the current context of global climate change and mass species extinction. Keystone species play a critical role in the health and survival of ecosystems by promoting nutrient cycling and controlling the population dynamics of other species (de Visser et al., 2012). Wildlife authorities are thus concerned by the diminishing tiger populations in India, an apex predator that helps maintain biodiversity in forest ecosystems in addition to the livelihoods of Adivasi [Indigenous] communities (Vaidyanathan, 2019). Although government-led Project Tiger is reported to have grown tiger numbers by over 33% and is lauded by international media as a successful conservation effort, deeper examination has revealed population growth occurring only in a few specific regions. Tigers are still slowly vanishing from many of India's forests, signaling the need for a different, more effective approach with Project Tiger (Girtonia, 2023; Vaidyanathan, 2019).

Rooted in casteist origins, Project Tiger enabled the forceful displacement of the Adivasis and led to the loss of forest communities and cultures to make way for tiger reserves (Rai et al., 2019). While the Indian tiger conservation effort has evidently chosen to disregard the human dimensions involved, researchers now increasingly highlight a need for the opposite (Rastogi et al., 2014). Many wildlife managers and scholars believe the restoration of Indigenous land rights and close observation of the synergy of these tribes with tigers in the natural environment are key to solving the issue of depleting tiger populations (Jolly et al., 2022). After all, the Adivasi and the big cats have maintained human-wildlife coexistence for millennia by respecting each other's presence and roles in the forests (Aiyadurai, 2016; Nair et al., 2021). This essay considers the human dimensions of the ongoing tiger conservation effort in India, reviewing case studies covering human-wildlife coexistence and other relevant literature to assist Indian wildlife managers in determining an effective strategy moving forward.

Methods

This paper investigates human-wildlife coexistence as a potential focus area for Project Tiger authorities in India by summarizing and analyzing three case studies involving South Asian Indigenous communities that practice peaceful lifestyles alongside wildlife. The chosen literature specifically covers the mutualistic relationships of tribal communities with “big cats,” namely the Bengal Tiger and Asiatic Lion. Although Project Tiger focuses on tiger conservation, including the Asiatic lion offers valuable insights due to the similar ecological behaviors of both species. These case studies are drawn from regions in India and Nepal, two countries that share similar topographic and climatic conditions.

To ensure a comprehensive understanding of coexistence, the communities represented in the case studies were selected based on their diverse contexts and unique value perceptions. This approach helps to address the multifaceted nature of coexistence. Broad, straightforward keywords such as “tiger,” “coexistence,” and “India” were primarily used during the online search to identify relevant literature for this comparative case study.

Literature Review

The Mishmi and Their Kinship with Tigers

In their article "Tigers are Our Brothers: Understanding Human-Nature Relations in the Mishmi Hills, Northeast India," Aiyadurai (2016) explores the intricate relationship between the Mishmi people and their natural environment, particularly focusing on tigers. The Mishmi inhabit the Dibang Valley in Arunachal Pradesh, a region known for its rich biodiversity and rugged terrain. Historically, the area has seen tensions between local practices and state conservation efforts, particularly with the establishment of the Dibang Wildlife Sanctuary in the 1990s, which led to fears among the Mishmi of land seizures and restricted access to resources (Aiyadurai, 2016).

Central to the Mishmi worldview is the belief that tigers are their brothers, a concept deeply embedded in their mythology and cultural practices. This kinship with tigers is not merely symbolic but translates into tangible conservation practices. Killing a tiger is considered 'homicide,' and the accidental death of a tiger necessitates elaborate rituals, such as the Taamaamran, conducted by a senior igu. These rituals are akin to human funerary practices and

involve significant community participation and expenditure, reflecting the high regard in which tigers are held (Aiyadurai, 2016).

Hunting practices among the Mishmi are governed by strict taboos and rituals, which play a critical role in maintaining harmonious coexistence with wildlife. Before embarking on a hunt, hunters perform rituals to seek safety and success, adhering to a moral code that respects the hunted animals. These practices ensure that hunting is approached with a sense of moral responsibility, often resulting in fewer hunting trips and regulated hunting activities. The fear and reverence for Golon, the forest spirit believed to inhabit the mountains and supply animals to hunters, strongly reinforce these conservation-oriented behaviors, as hunters must offer a tribute after a successful hunt to avoid Golon's wrath, which could result in accidents, severe illness, or misfortune for the hunter and their family (Aiyadurai, 2014a, 2016b).

The article highlights the contrasting perceptions of tigers among the Mishmi, the state, and the scientific community. While the Mishmi view tigers as kin and integral members of their ecosystem, the state and conservationists often see tigers as endangered species requiring protection through stringent regulations and reserves. These divergent understandings of nature lead to conflicts, as evidenced by the resistance against a government survey team attempting to study tiger presence in the Dibang Valley in 2014. The lack of consultation with local leaders and the imposition of top-down conservation measures exacerbates these tensions (Aiyadurai, 2016).

The Mishmi argue that tigers should not be isolated in reserves but should coexist with humans in their shared ecosystem. They believe that both tigers and humans are integral to the ecosystem and can protect each other. This perspective challenges the conventional conservation

approach that seeks to minimize human interference in natural habitats. The Mishmi's belief in the reciprocal relationship with the forest and its spirits underscores a conservation ethos that is deeply rooted in cultural values and practical knowledge of the landscape (Aiyadurai, 2016).

The article by Aiyadurai (2016) provides a compelling case for recognizing the value of indigenous conservation practices and the need for a shift towards community and place-based approaches in conservation research and policy. The Mishmi's deep cultural connection to tigers and their environment exemplifies how indigenous perspectives can contribute to the conservation discourse, offering insights that challenge and enrich conventional methods.

In conclusion, acknowledging the Mishmi's place-based perceptions and practices is essential for effective and inclusive conservation strategies. Aiyadurai's (2016) work calls for a reevaluation of top-down conservation models and advocates for a more nuanced understanding of human-nature relationships that respects and incorporates indigenous knowledge systems.

Sharing Space with Tigers in Chitwan National Park

The Tharu people, indigenous to the Terai region of southern Nepal, have a long history of coexistence with the wildlife of Chitwan National Park. This area, a flagship protected zone for imperiled wildlife, including the Bengal tiger, has been a focal point of conservation efforts due to its high biodiversity and significant human population pressures. The backdrop of this region includes notable efforts to balance human livelihoods with wildlife conservation, making it a pertinent case study for examining fine-scale coexistence between large carnivores and humans. The study by Carter et al. (2012) provides empirical evidence that tigers and humans

can indeed coexist at very fine spatial scales, a notion that challenges prevailing beliefs in conservation policy.

One of the significant findings of Carter et al. (2012) is that tigers spatially overlapped with people on foot and in vehicles, both inside and outside the park, across the study years. This overlap is particularly notable near forest roads rather than on the smaller trails typically used by local residents. The spatial adjustments made by tigers, such as using areas less frequented by humans during the day and becoming more active at night, are clear indicators of behavioral adaptations to avoid conflict and maintain harmony with humans (Carter et al., 2012).

Notable data from the study highlights the significance of these findings. Tiger density in Chitwan National Park was found to be higher than in numerous sites in Central and North India and several times higher than sites in Laos, Indonesia, Malaysia, and Bhutan. Additionally, tiger occupancy was 12-30% greater than in sites in Indonesia and India. Human foot traffic in Chitwan was also significantly higher than in other tiger range areas, indicating a unique situation of high-density coexistence (Carter et al., 2012).

The presence of abundant tiger prey in the region is a crucial factor contributing to high tiger densities. Conservation-oriented policies implemented since 1996, such as the removal of livestock and participatory forest management, have led to increased forest biomass outside the park, thus supporting a higher density of wild ungulates such as wild deer and boar, which are primary prey for tigers. This abundance of prey helps sustain the tiger population, as it reduces the need for tigers to venture into areas of high human activity in search of food (Carter et al., 2012). Additionally, low levels of poaching in the region significantly benefit tiger conservation.

The end of the civil war in Nepal in 2006 marked a turning point, with heightened efforts to control poaching and improve habitat conditions. Effective management policies, such as those that reduce exploitation and enhance habitat quality, have been instrumental in maintaining high tiger densities (Carter et al., 2012).

The case of Chitwan National Park teaches us that it is possible to meet human needs while sustaining wildlife populations. The coexistence of tigers and local communities in Chitwan illustrates that with appropriate management strategies, large carnivores can thrive even in human-dominated landscapes. The lifestyles of the Tharu people, who rely on the forest for resources while cohabiting with tigers, exemplify this balance (Carter et al., 2012).

In conclusion, the research by Carter et al. (2012) demonstrates that integrating fine-scale spatial and temporal insights into conservation planning is crucial. By understanding and incorporating the spatial and temporal dynamics of human-wildlife interactions, conservation efforts can be better tailored to foster coexistence, ultimately meeting the dual goals of human welfare and wildlife conservation. This case study from Chitwan National Park provides valuable lessons for future conservation strategies in similarly human-dominated regions.

The Peaceful Tradeoff between the Maldhari and Asiatic Lions

The Maldhari people, a semi-nomadic pastoral community, have lived in the Gir Forests of Gujarat, India, for over a century and a half. Practicing Hinduism, the Maldharis hold strong ethical and sentimental values towards nature and its resources, relying primarily on livestock rearing for their livelihoods (Banerjee et al., 2013). Historically, the Gir Forests have seen a fluctuating relationship between the Maldharis and the Asiatic lions, with their coexistence

emerging as a unique example of human-wildlife adjustment. At the beginning of the nineteenth century, the Asiatic lion population dwindled to around 50 individuals due to hunting and habitat loss but has since rebounded to approximately 400 individuals, thanks to stringent conservation measures (Banerjee et al., 2013). This literature review examines the mutual adaptations between the lions and the Maldharis, showcasing how both parties adjust their behaviors to accommodate each other.

One of the critical aspects of this coexistence is the dietary habits of the lions. Research indicates that lions in the Gir forests primarily scavenge on cattle carcasses rather than actively preying on healthy livestock. They tend to target unproductive or old cattle, minimizing the economic impact on the Maldharis (Banerjee et al., 2013). Scat analysis and continuous monitoring of radio-collared lions revealed that livestock contributes between 25 to 42% of the lions' biomass consumption, with only 16% resulting from active predation (Banerjee et al., 2013). This scavenging behavior of lions represents a cooperative adaptation that reduces direct conflict with the Maldhari pastoralists.

Economic support from governing entities plays a crucial role in maintaining this coexistence. The Maldharis benefit significantly from free grazing rights within the Gir forests, which helps them control annual livestock rearing costs compared to non-forest-dwelling pastoralists (Banerjee et al., 2013). Additionally, the government compensation scheme for livestock predation provides substantial economic relief to the Maldharis. This scheme offsets the financial losses due to lion predation, effectively reducing the Maldharis' annual financial loss to a minimal percentage of their average per capita income (Banerjee et al., 2013). Together,

these economic supports ensure that the Maldharis can sustain their livelihoods while coexisting with lions.

Interestingly, lion densities are higher in areas with Maldhari livestock than in areas without it. This observation underscores the mutually beneficial relationship between the two parties (Banerjee et al., 2013). While lions benefit from a steady food source, primarily through scavenging on livestock carcasses or preying on less productive animals, the benefits for the Maldharis are more nuanced. They gain access to the forest's ecological services and receive compensation for livestock losses due to predation. However, this compensation often falls short in addressing the full economic and social impact of livestock losses, raising questions about its adequacy in sustaining long-term coexistence.

Temporal and spatial adjustments by the Maldharis further facilitate their coexistence with the lions. The Maldharis corral their livestock at night in 'bomas' to protect them from nocturnal lion attacks and graze their herds during the daytime, avoiding peak lion activity periods. Spatially, Maldhari herds are composed of mixed livestock, with cattle leading, buffaloes in the middle, and juvenile animals trailing. This arrangement ensures that lions are more likely to attack the less valuable, unproductive cattle, minimizing economic losses (Banerjee et al., 2013). These traditional practices of corralling and strategic herd composition, combined with the presence of expert herdsman, effectively reduce predation risks.

However, changing perceptions among younger Maldharis pose potential challenges to this delicate balance. Influenced by globalization and free markets, the younger generation is less tolerant of even small monetary losses, which older generations viewed as inevitable (Banerjee et

al., 2013). This shift in attitudes may lead to increased conflicts and reduced tolerance for lions, potentially jeopardizing the long-standing coexistence. Similar transitions have been observed in other pastoral communities, such as the Masai in eastern Africa, where changing values have led to increased retaliatory killings of lions (Banerjee et al., 2013).

In conclusion, the coexistence of the Maldharis and the Asiatic lions in the Gir forests is a complex interplay of behavioral adjustments, economic support, and traditional practices. The cooperative behaviors of lions, combined with the economic benefits and temporal-spatial adjustments by the Maldharis, create a win-win situation that supports the conservation of lions and the livelihoods of the pastoralists. However, maintaining this balance requires continuous support and adaptive management, especially in light of changing generational attitudes. The case of the Maldharis and the Gir lions highlights the importance of integrating local knowledge and economic incentives in conservation strategies to foster sustainable human-wildlife coexistence (Banerjee et al., 2013).

Discussions

Overall, these case studies highlight the importance of incorporating indigenous knowledge, socio-economic support, and institutional frameworks in fostering human-wildlife coexistence. However, successful and meaningful cooperation with the Adivasi can only occur once the historical injustices of Project Tiger are addressed and the land of displaced communities returned. Trust-building activities and involving local communities in the co-management of conservation efforts are crucial steps (Ogra, 2009).

Additionally, deeply exploring current attitudes held by different genders and age groups of stakeholder Adivasi groups is necessary. Studies have shown that human-wildlife conflict impacts communities heterogeneously, particularly along gender lines. Documenting and understanding these gendered perceptions are crucial for creating inclusive and effective conservation policies (Doubleday & Rubino, 2022). Introduction of more environmental education programs can help local stakeholders hold informed and tolerant viewpoints. Such programs can increase positive attitudes toward tigers and equip participants with knowledge and skills to mitigate conflict situations, promoting safety and positive human-wildlife relationships (Salazar et al., 2024).

Moreover, while this paper has highlighted the importance of economic compensation in increasing willingness-to-coexist, it must be delivered honestly, efficiently, and effectively to achieve tangible results. Studies have identified inadequate remuneration, processing delays, and corruption as current problems that persist throughout India. Improved communication about what compensation can and should be, along with more sustainable and socially just forms of payment, are necessary (Ogra & Badola, 2008). Ultimately, with a multi-faceted approach that is respectful and inclusive of Indigenous groups and practices, sustainable human-wildlife coexistence is clearly a promising and foreseeable path for the future of Project Tiger.

References

- Aiyadurai, A. (2014). Traditional Ecological Knowledge of the Idu Mishmis: What do people say about wildlife? *Report for the 2nd Rufford Small Grant for Nature Conservation*. chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://ruffordorg.s3.amazonaws.com/media/project_reports/12697-2%20Detailed%20Final%20Report.pdf
- Aiyadurai, A. (2016). Tigers are Our Brothers: Understanding Human-Nature Relations in the Mishmi Hills, Northeast India. *Conservation and Society*, 14(4), 305–316. <https://doi.org/10.4103/0972-4923.197614>
- Banerjee, K., Jhala, Y. V., Chauhan, K. S., & Dave, C. V. (2013). Living with Lions: The Economics of Coexistence in the Gir Forests, India. *PloS One*, 8(1), e49457–e49457. <https://doi.org/10.1371/journal.pone.0049457>
- Carter, N. H., Shrestha, B. K., Karki, J. B., Pradhan, N. M. B., & Liu, J. (2012). Coexistence between wildlife and humans at fine spatial scales. *Proceedings of the National Academy of Sciences - PNAS*, 109(38), 15360–15365. <https://doi.org/10.1073/pnas.1210490109>
- de Visser, S., Thébault, E., & de Ruiter, P. C. (2012). Ecosystem Engineers, Keystone Species. In *Ecological Systems* (pp. 59–68). Springer New York. https://doi.org/10.1007/978-1-4614-5755-8_4
- Doubleday, K. F., & Rubino, E. C. (2022). Tigers bringing risk and security: Gendered perceptions of tiger reintroduction in Rajasthan, India. *Ambio*, 51(5), 1343–1351. <https://doi.org/10.1007/s13280-021-01649-0>

- Girdonia, Srajan. (2023, April 10). Tiger Census 2023: 33% Increase in Tiger Population in the Country. *The Processor*. <https://theprocessor.in/good-governance/tiger-census-2023-33-increase-in-tiger-population-in-the-country>
- Jolly, H., Satterfield, T., Kandlikar, M., & TR, S. (2022). Indigenous insights on human–wildlife coexistence in southern India. *Conservation Biology*, 36(6), e13981-n/a. <https://doi.org/10.1111/cobi.13981>
- Nair, R., Dhee, D., Patil, O., Surve, N., Andheria, A., Linnell, J. D. C., & Athreya, V. (2021). Sharing Spaces and Entanglements With Big Cats: The Warli and Their Waghoba in Maharashtra, India. *Frontiers in Conservation Science*, 2. <https://doi.org/10.3389/fcosc.2021.683356>
- Ogra, M., & Badola, R. (2008). Compensating Human-Wildlife Conflict in Protected Area Communities: Ground-Level Perspectives from Uttarakhand, India. *Human Ecology : An Interdisciplinary Journal*, 36(5), 717–729. <https://doi.org/10.1007/s10745-008-9189-y>
- Ogra, M. (2009). Attitudes Toward Resolution of Human-Wildlife Conflict Among Forest-Dependent Agriculturalists Near Rajaji National Park, India. *Human Ecology : An Interdisciplinary Journal*, 37(2), 161–177. <https://doi.org/10.1007/s10745-009-9222-9>
- Rai, N. D., Benjaminsen, T. A., Krishnan, S., & Madegowda, C. (2019). Political ecology of tiger conservation in India: Adverse effects of banning customary practices in a protected area. *Singapore Journal of Tropical Geography*, 40(1), 124–139. <https://doi.org/10.1111/sjtg.12259>

- Rastogi, A., Hickey, G. M., Badola, R., & Hussain, S. A. (2014). Understanding the Local Socio-political Processes Affecting Conservation Management Outcomes in Corbett Tiger Reserve, India. *Environmental Management (New York)*, 53(5), 913–929. <https://doi.org/10.1007/s00267-014-0248-4>
- Salazar, G., Satheesh, N., Ramakrishna, I., Monroe, M. C., Mills, M., & Karanth, K. K. (2024). Using environmental education to nurture positive human–wildlife interactions in India. *Conservation Science and Practice*, 6(3). <https://doi.org/10.1111/csp2.13096>
- Vaidyanathan, G. (2019). India’s tigers seem to be a massive success story — many scientists aren’t sure. *Nature (London)*, 574(7780), 612–616. <https://doi.org/10.1038/d41586-019-03267-z>