Sustainability and Biodiversity Conservation

# Designation of Nauradehi and Veerangana Durgavati wildlife sanctuary as Tiger Reserves in Madhya Pradesh, India: Advancing landscape-level biodiversity conservation

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## Abstract

Landscape surrounding and existing within a protected area has a vital role in biodiversity conservation. Landscape conservation facilitates in bringing all the stakeholders on a single platform to collaborate their ideas on managing important biodiversity areas for long-term sustainability. Significant efforts have been made for the management and conservation of biodiversity-rich areas across the larger landscapes. Declaring Nauradehi Wildlife Sanctuary and Veerangana Durgavati Wildlife Sanctuary as Tiger Reserve is noteworthy because they have great ecological and conservation values. The declaration of these sanctuaries as a tiger reserve shall strengthen the landscape management approach, facilitate the population of tigers to move across a large landscape, and establish their wider territories for gene flow. It is also important to document and observe in the next few years, how the tigers adapt and how the development of the area would help the locals without affecting conservation.

**Keywords:** Landscape conservation, Veerangana Durgavati tiger reserve, biodiversity, Madhya Pradesh, India

## Introduction

In the present scenario when wildlife is facing the consequences of climate change, pollution, and expanding linear infrastructure; “Landscape-level conservation” addresses scaling up our conservation initiatives and actions. Large landscape connectivity is crucial for wildlife conservation through unprotected areas (DeFries et al., 2023). Ecological connectivity is one of the successful conservation tools that can reduce the negative effects of climate change on

biological diversity (Heller & Zavaleta, 2009; Brennan et al., 2022). The assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) 2019 emphasized the importance of ecological connectivity for the functioning of ecological systems and its relation with economic growth and development. To achieve the impact required for reversing negative biodiversity trends, current conservation initiatives need a wider landscape approach surrounding protected areas (Kleijn et al., 2020). Landscape conservation facilitates in bringing all the sectors and stakeholders in a single platform to collaborate their ideas on managing important biodiversity areas for long-term sustainability. Significant efforts have been made for the management and conservation of biodiversity-rich areas across the larger landscapes (BCRLIP, 2018). Nauradehi Wildlife Sanctuary (situated in Sagar, Damoh and Narshingpur districts) and Veerangana Durgavati Wildlife Sanctuary (located in Damoh district) in the State of Madhya Pradesh have been notified in September 2023 as Veerangana Durgavati tiger reserve (under section 38V of Wildlife (Protection) Act, 1972) which represents the floral and faunal attributes of the Central Indian forested landscape. This protected area is now the 54$^{th}$ Tiger Reserve in the country and seventh in the State of Madhya Pradesh. Spread over an area of 1197.04 sq. km (classified under the Deccan Peninsula biogeographic region), Nauradehi Wildlife Sanctuary has a connecting forest patch with Veerangana Durgavati Sanctuary towards the east. The forest type of the sanctuary is classified as the Tropical Dry Deciduous Forest which consists of the Central Indian monsoon forest viz. Teak, Saja, Dhaora, Bhirra, Ber, Bel, Mahua, Tendu, Gunja and Amla etc. Faunal bio-diversity consists of Panther, Sloth Bears, Wild dogs, Hyenas, Indian Wolves, Indian Foxes, and Jackals in Carnivores and Sambhar, Nilgai, Chinkara, Cheetal, Blackbuck and wild boar (https://www.nauradehiwls.in/). The Veerangana Durgavati Wildlife Sanctuary was created in the year 1996 and has an area of 23.97 sq. km characterized by dry deciduous mixed forests and teak forests (Tiwari, 2003). 12 species of hawk moths have been reported from this sanctuary (Chandra et al., 2013). Important faunal species include leopard, wolf, jackal, Indian fox, striped hyena, sloth bear, spotted deer, Sambar deer, nilgai, chinkara, wild pig, and chowsingha (MoEFCC, 2021).

**Veerangana Durgavati Tiger Reserve**

Declaring Nauradehi Wildlife Sanctuary and Veerangana Durgavati Wildlife Sanctuary as Tiger Reserve is noteworthy because it has great ecological and conservation values. The core and the buffer areas of the tiger reserve cover a total land area of 141400.86 hectares and 92512.21 hectares

respectively. In order to manage and protect the pristine biodiversity of these sanctuaries, the Government of India has already notified Eco-Sensitive Zone (ESZ) around the sanctuaries adhering to prohibited, regulated, and promoted activities. In the case of Veerangana Durgavati Wildlife Sanctuary, the extent of uniform two kilometers around the boundary has been declared as ESZ in the year 2021. For Nauradehi Wildlife Sanctuary, with an average extent of one kilometer around the boundary has been declared as ESZ in the year 2017. Ministry of Environment, Forest and Climate Change declares Eco-sensitive zones to protect the biodiversity of the area outside protected areas viz. namely National Parks, Wildlife Sanctuaries, Biosphere Reserves, and community reserves. Eco-tourism is a regulated activity in such Eco-sensitive zones (MoEFCC, 2021).

It is our assumption that the tiger movement may increase in the Ranipur Tiger Reserve and Veerangana Durgavati Tiger Reserve from the Panna Tiger Reserve (PTR) in the following years considering the development of the Ken-Betwa River Interlinking Project. The Ken-Betwa River Interlinking project is expected to serve the drought-prone areas in the Bundelkhand region in Uttar Pradesh. It is expected that a significant part of PTR will face geographical changes due to the consequences of waterlogging and submergence (Parveen and Ilyas, 2021). A recent study revealed that 58.03 $km^2$ of the Critical Tiger Habitat in Panna Tiger Reserve will be sacrificed due to the Ken-Betwa River Interlinking Project, owing to submergence, and an indirect loss of 105.23 $Km^2$ of Critical Tiger Habitat will be inevitable due to fragmentation and loss of connectivity (Parveen and Ilyas, 2021). We are of the opinion that as the eastern, southern, and western boundaries of the Ranipur Tiger Reserve are adjacent to the border of Madhya Pradesh, there would be huge scope to implement an integrated approach for developing a long-term management action plan for tiger conservation and interstate cooperation.

## Discussion

Tiger is a territorial species, in which males usually need a home range of about 60-150 $km^2$ and females need 20-60 $km^2$ (Vaidyanathan, 2019). They are known to occupy large home ranges and travel long distances across different landscapes. In the year 2019, a tiger of unknown sex was captured in a camera trap in the Madhmaheswar area of Ukhimath forest in Kedarnath Wildlife Sanctuary at an elevation of 3,431m, which was the highest elevation record of tiger's presence in the Uttarakhand State, as well as in India (Pawar et al., 2020). Prior to this observation, in the year 2016, a female tiger was recorded at an elevation of 3,274 m from the Askot landscape in Uttarakhand State (Bhattacharya & Habib, 2016). In Uttarakhand, Rajaji National Park was

considered the geographical distribution range of the tiger which was approximately 1000m (Rasaily, 2012). Considering that the entire landscape of the Veerangana Durgavati Wildlife Sanctuary and Nauradehi Wildlife Sanctuary is endowed with a wide array of wild ungulates and other prey species, therefore, it can be assumed that the tigers may use the landscape for their movement and predation. The declaration of this tiger reserve shall strengthen the landscape management approach, facilitate the population of tigers to move across a large landscape, and establish their wider territories for gene flow. It is pertinent to mention that Panna Tiger Reserve is one of the most successful examples of tiger re-introduction. In the year 2009, the area had no tigers, however, in the year 2019, the reserve was blessed with 54 tigers (Parveen & Ilyas, 2021). The buffer areas and corridors that link Ranipur Tiger Reserve and Veerangana Durgavati Tiger Reserve with Panna Tiger Reserve consist of densely populated areas and cultivated fields (Parveen & Ilyas, 2021). Restoring the corridors needs to be addressed scientifically, while also ensuring local community participation. Wildlife (Protection) Act, 1972 empowers the State Government for relocation of people from the Critical Tiger Habitat to mitigate and address man-animal conflict. The concept of ecotourism in protected areas and its implications for the conservation of biodiversity are of global significance. As the management and conservation of tigers is not an easy task, especially in populated areas, ecotourism plans must be designed in a way that creates the right incentives to change people's attitudes and adoption of green social responsibilities. Besides, the ecotourism approach must also be ecologically sound, linking the tiger conservation and livelihood opportunities (Figure 1) to the local communities. Bundelkhand region of Madhya Pradesh has various nearby protected areas (including the Panna Tiger Reserve and Veerangana Durgavati Tiger Reserve) which are yet to be explored for their full potential for ecotourism development (Patel & Anuragi, 2023). The NITI Aayog & UNDP report from 2012 on the region identified tourism as one of the potential measures to fight poor socio-economic development in the area (Human Development Report Bundhelkhand, 2012).

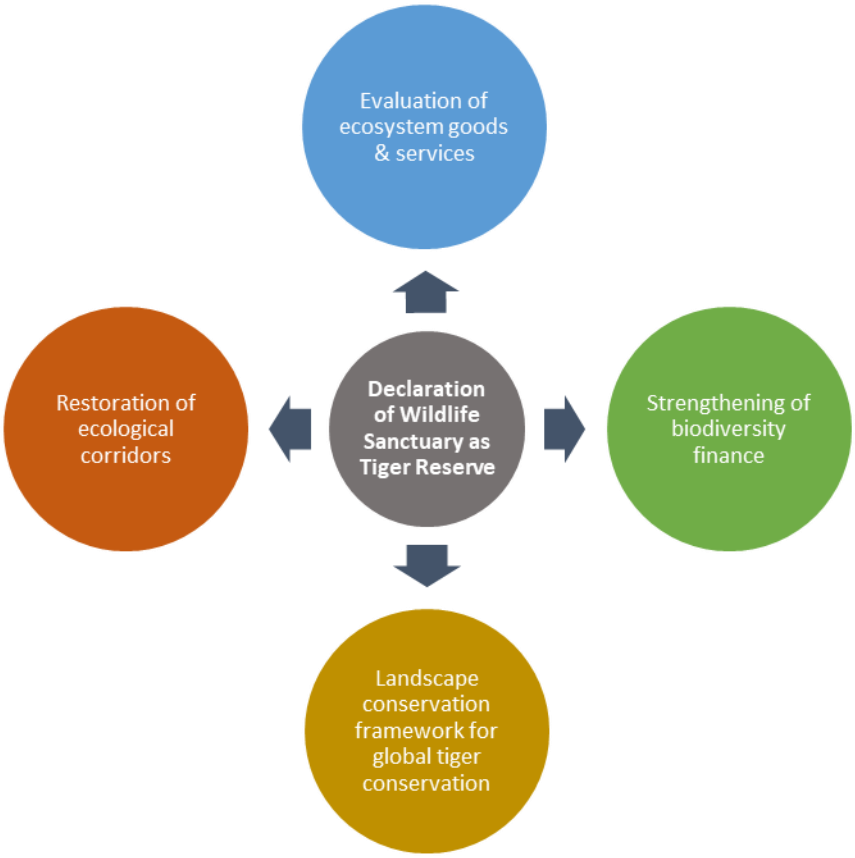


**Figure 1**. Opportunities from the declaration of Wildlife Sanctuary as a Tiger Reserve

## Conclusion

Landscape surrounding and existing within a protected area has a vital role in biodiversity conservation. Since the tiger represents diverse ecological systems and encompasses almost all of the habitats in the range countries (Bilal et al., 2017), it can be assumed that the tiger may acclimatize to the local conditions and roam freely across this landscape. Availability of prey species and evaluation of management and effectiveness of protected habitats are some of the important aspects to be considered for demonstrating a successful model of the relationship between people and wildlife. Environmental challenges need to be prioritized considering the current environmental conditions. Besides, opportunities and challenges also needed to be identified with respect to large landscape management and conservation, which should foster to development of a set of conservation initiatives. Moreover, local communities are required to strengthen such landscape-level conservation approaches covering aspects like biodiversity, climate change, and livelihood. It is also important to document and observe in the next few years how the development of the area would help the locals without affecting conservation.

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