

Assessment of Ecotourism Potential of Sariska Tiger Reserve for Growth of Green Economy

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Abstract

Ecotourism has emerged as a sustainable and environmentally responsive form of tourism that aims to conserve natural ecosystems, encourages cultural heritage, and assist to local economies. Sariska Tiger reserve (STR) renowned for its rich biodiversity, iconic tiger population, and cultural heritage located in Alwar district, Rajasthan, presents a promising landscape for ecotourism development. The abstract explores the potential of integrating geospatial technology and Statistical tools into ecotourism planning and management strategies to foster a green economy as per the new eco- tourism policy of Rajasthan-2021. To identify the ecotourism potential of different area GIS model is used considering potential factors like heritage and culture sites, unique features, wild animals, topography, land cover and distance from major roads. GIS Model is used to identify the new potential ecotourism sites, under stressed tourism area of STR. Through field survey important eco- tourism sites and eco sensitive zones were identified, and major challenges for local community transformation. Landsat 8 satellite imagery is used for monitoring analysis of geospatial data. Study shows direct relation of tiger population on tourism flow. SWOT analysis is used to identify various factors which will affect the tourism flow. The integration of geospatial technology in ecotourism planning aligns with the principles of a green economy, fostering economic growth while minimizing environmental impact. Local communities stand to benefit from increased job opportunities in ecotourism, and revenue generated from responsible tourism can be reinvested in conservation efforts. It further motivates to develop efficient transportation networks, reducing carbon emissions associated with travel.

Keywords Green Economy, Sariska Tiger Reserve, Rajasthan, Ecotourism

Introduction

Ecotourism is a type of sustainable tourism that takes place in a protected natural or cultural heritage area, where local participation, resource management, cultural preservation, indigenous knowledge and practices, environmental education and ethics, as well as economic gains are encouraged and pursued for the benefit of the host community and tourists (Forest Department, 2021). Socio-cultural betterment is a key prospective of ecotourism and both the pillars of ecotourism nature and people play crucial role in conservation of natural resources (Das & Chatterjee, 2015). The most valuable natural ecosystem in terms of societal well-being is the forest. Forests need to be protected for the economy, ecological, scientific, and cultural significance because they serve as the ecological foundation for life on Earth, not only by managing the climate and water resources, but also by providing habitat for plants and animals (Rajasthan Forest Dept., 2023). Developing nation are struggling in managing their resources, coexistence model aka community bases

ecotourism is vital for biodiversity conservation (Samal & Dash, 2023). For fragile ecosystem ecotourism brings awareness among local community and visitors. Wildlife and tribal population are two key parameters for due importance of ecotourism in Asia and Africa (Hasana et al., 2022). SWOT analysis in Kermanshah province, Iran shows public participation and awareness, job creation for locals, construction of welfare facility for tourist and wildlife conservation are the major opportunity whereas corruption, mining activity, tree cutting, forest fire is some of the major threats (Heshmati et al., 2022). Development of geo ecotourism using remote sensing and GIS by LULC and AHP investigation for discovering potential new sites, reduce stress from old sites, reducing haphazardness, ensuring infrastructural development and improving connectivity and accessibility (Acharya et al., 2022). Natural resources are vital for the development of community-based ecotourism and encouragement of homestay and guest house program would help in sustainable development of village and enhance green economy (Kukreti, 2021).

Materials and methods

Study Area:

Famous Indian tiger reserve Sariska is entirely contained inside Alwar district of Rajasthan state. It is located in the Aravalli Mountains, one of the oldest mountain ranges in the world, and has a subtropical dry climate that makes it a special habitat for tigers. It is home to some IUCN Red List species including the four-horned antelope and the rusty spotted cat and has a high level of biotic richness with endemic species of both flora and wildlife. Additionally, the Tiger Reserve has a rich cultural past. Latitude and longitude of the STR's core zone are 27°05' to 27°38' North and 76°14' to 76°32' East, respectively. The STR's core zone has an area of 881.112 km², of which 274 km² have been designated as national parks and total area of buffer zone including revenue buffer is 332.22 km²(Tiger Conservation Plan Sariska Tiger Reserve, n.d.). The altitude of STR lies between 270m and 360m (Babbar et al., 2021).

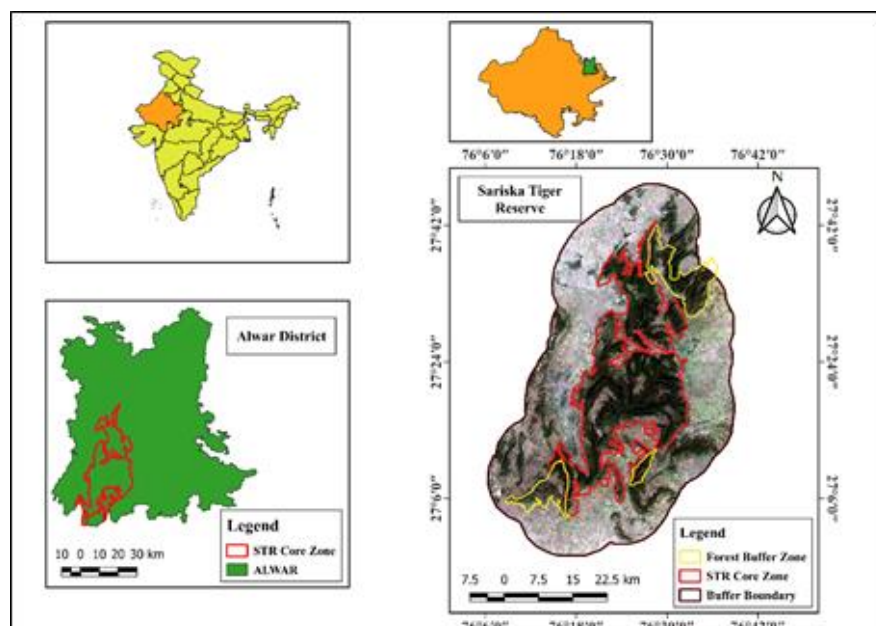


Fig.1 STR Study Area Map.

Table1 Data information table.

Data	Types of Data	Data Sources	Data Information	Time Period
LANDSAT 8 OLI/TIRS	Spatial	USGS earth explorer	Path=147/Row=41 (30m resolution)	October, 2022
Base map	Spatial	National Tiger Conservation authority (MoEF&CC)	Raster TIFF	January, 2022
DEM	Spatial	Sariska Tiger Conservation Plan	JPG	2014-2024

To find out the potential of Eco-Tourism and new eco- Tourism Sites inside STR buffer and its Periphery ODK Collect platform was used and a field survey was conducted in 2022–2023 with a total of 70 GPS points acquired using a random sampling technique. Digital elevation model (DEM) is used to find out the elevation for site suitability for the potential site of eco-tourism development.

SWOT analysis was conducted on the bases of Tourist flow data and its past trend and field survey to find out the scope of Eco and Rural Tourism in STR.

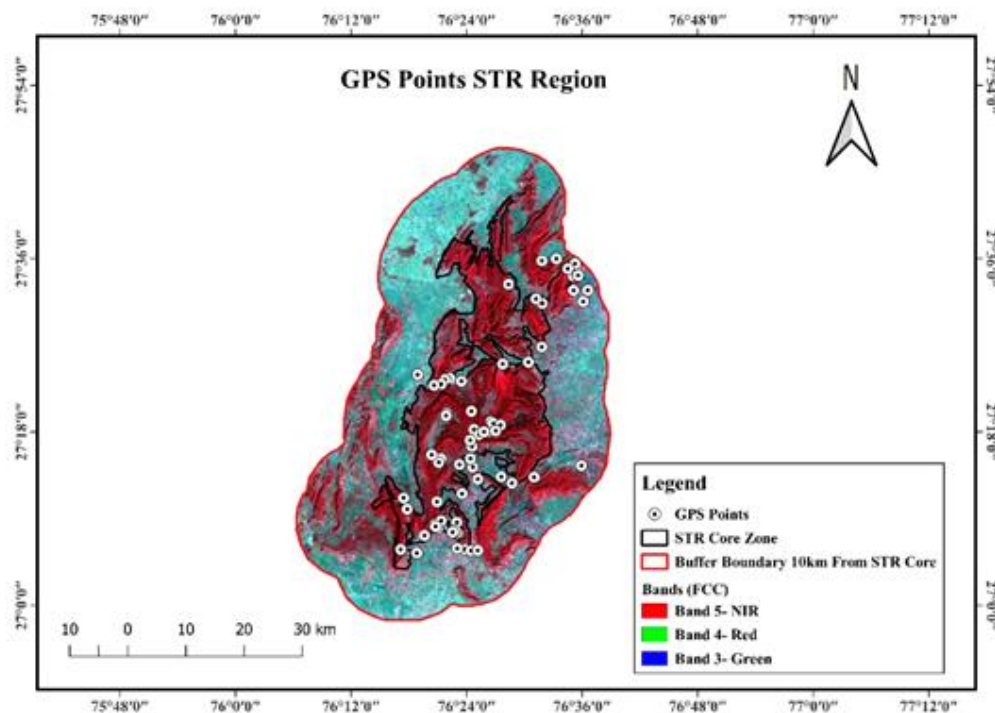


Fig.2 Ground Control Points in STR.

Table 2 Tourist flow data (as per Sariska Tiger Conservation Plan 2014-2024).

No.	Period	Domestic Visitors	Foreign Visitors	Students	Total	Entry Fee Collected (Rs)
1	2001-2002	40716	15289	2705	58710	56,06,771.00
2	2002-2003	36097	6824	4163	47084	33,61,705.00
3	2003-2004	32079	6897	3657	42633	34,42,251.00
4	2004-2005	39717	12546	5060	57323	52,54,025.00
5	2005-2006	16739	5999	1869	24607	24,80,495.00
6	2006-2007	21740	6428	2446	30614	28,19,301.00
7	2007-2008	23066	5378	3306	31750	26,98,238.00
8	2008-2009	31776	4524	2297	38597	29,08,750.00
9	2009-2010	35198	5187	3863	44248	32,89,790.00
10	2010-2011	34139	6169	3928	44236	69,46,925.00
11	2011-2012	28395	3737	2271	34403	82,30,125.00
12	2012-2013	20085	2138	840	23063	67,31,253.00
13	2013-2014	27805	2410	2146	32361	72,37,193.00

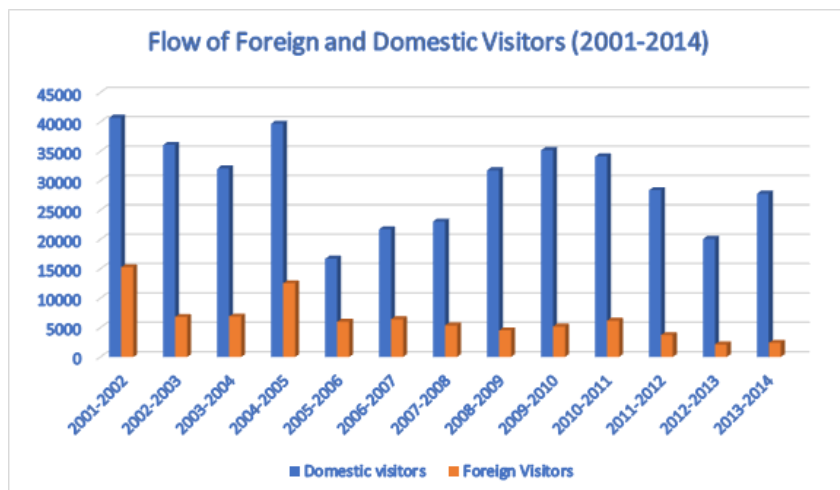


Fig. 3 Chart showing flow foreign and domestic visitors (2001-2014).

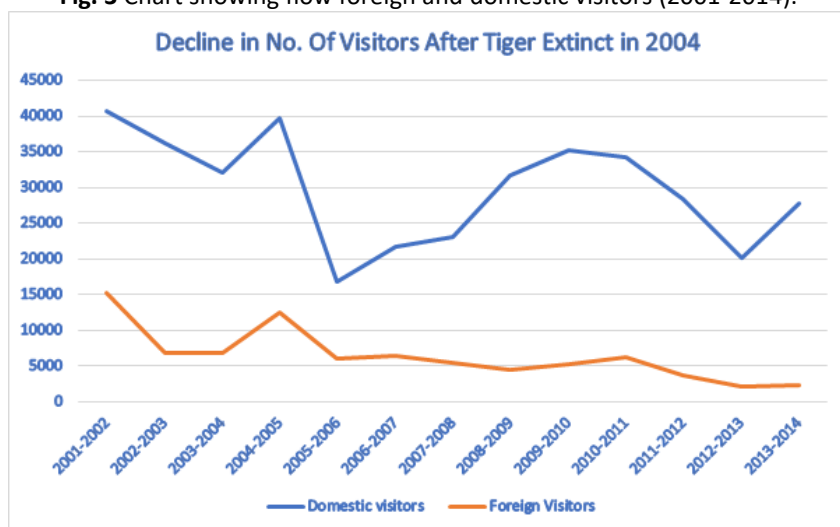


Fig. 4 Visitors flow after Tiger Extinct in 2004.

Result and Discussion

Result of tourism flow analysis, SWOT analysis, Field survey is presented in Fig3,4 and 5. Wildlife biodiversity plays significant role in tourism outcome specifically Tiger. There is visible decline in visitors number after tiger got extinct in 2004 which were later reintroduced in 2008. Tehla, Bhangarh, Ajabgarh, Talab, Rajgarh, Thanagazi, Alwar and various other region show huge potential of ecotourism. Focus should be on preserving and advertising of heritage and cultural sites and to promote community-based tourism taking villagers as an important stakeholder. There is lack of basic infrastructure in buffer region of STR.

SWOT Analysis

Strengths

- Location: Nearest to both National Capital Delhi and State Capital Jaipur.
- Beautiful natural Landscape.
- High flora and fauna biodiversity (housing over 404 plant species and 211 bird species).
- Excellent road and connectivity.
- Rich heritage and culture.
- Astronomy: Low atmospheric pollution which is perfect for stargazing.

Weakness

- Biotic disturbance due to local community and visitors' activities.
- High biomass extraction from villages inside and in periphery of STR.
- high risk of illegal entry and poaching due to large size of STR and its open boundaries from all sides.
- High flow of Pilgrims due to historical temples inside STR.
- Lack of basic infrastructure in STR region.

Opportunity

- Reintroduction of Tiger and its increasing population brought a new life to STR.
- Development of new mega highways provide easy access for visitors and locals.
- Development of Corridor Connectivity with Jamva Ramgarh wildlife sanctuary.
- Huge scope of Eco and Rural tourism in periphery and buffer Region of STR.
- Huge population of local people which could be useful for community-based development of STR and would enhance employment opportunity and awareness.

Threats

- Large number of entry point in STR leads to illegal entry and risk of poaching.
- High natural resource extraction due to mining in Tehla, Kho, Baldeogarh etc leads to fragmentation of habitat.
- Huge dependency on Timber, wood coal and other forest resources due to lack of employment and awareness among local community.

Themes	Major Destinations in STR
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Experience Tourism	Trekking-Bala Quila range, Naldeshwar, Neelkanth, Dadikar, etc. Mountain cycling- Bhangarh, Tehla, Bala Quila, Dadikar, etc.
Pilgrimage, cultural & festivals	Pandupol, Neelkanth, Bharthari, Narayani Mata, Naldeshwar, Garba ji, etc.
Wildlife Tourism	Top Carnivores- Tiger, Leopard, Striped hyena, Jackal, Rusty spotted cat, Palm civet. Herbivores- Chital, Nilgai, Sloth bear, Porcupines, Sambar deer, etc. Birds- Grey Partridge, Golden back woodpecker, Golden oriole, Green Pegin, etc.
Natural Landscape Rejuvenation	Kraska and Kankwari Plateau. Alwar, Tehla, Thanagazi, Baldeogarh, etc.
Eco/rural tourism	Tehla, Baldeogarh, Talab, Jahaj, Thanagazi, Kushalgarh, Siliserh, etc.
Water sports	Siliserh Lake, Jaisamand, Mangalsar lake, Tehla Lake, etc.
MICE (Meeting Incentive Convention Exhibition)	Alwar, Rajgarh, Tehla, Ajabgarh, etc.
Buddhist	Bairath
Heritage tourism	Sariska Palace, Bala Quila fort, Alwar City Palace, Siliserh, Kankwari Fort, Neelkanth, Rajgarh fort, Bhangarh, Ajabgarh, etc.
Railways and roads	Railway- Alwar, Dausa, Jaipur, etc. Road- Delhi Mumbai Greenfield Expressway, Jaipur Alwar State highway etc.

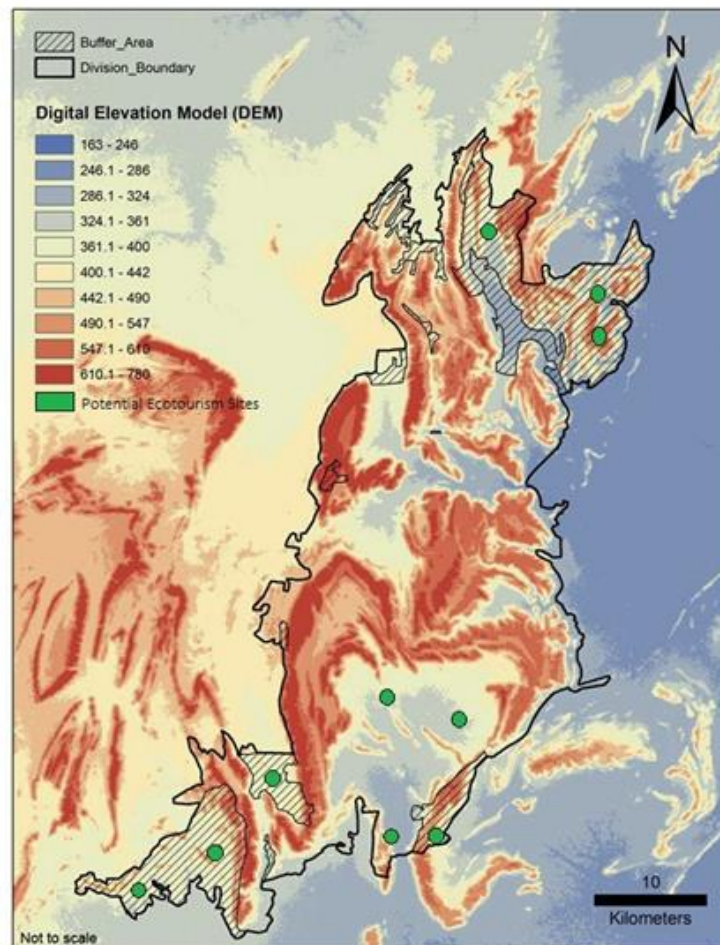


Fig. 5 Potential Ecotourism Sites.

Conclusion

The assessment highlights the vital role of biodiversity specifically fauna biodiversity in visitor's flow. Through field survey researcher identified key places inside STR which could be developed into potential ecotourism sites without disturbing the critical tiger habitat. SWOT analysis result gives huge opportunity of ecotourism development and important threats and weak areas on which government, local community and NGOs needed to work on. This information guides the development of laws and regulations on ecotourism and rural tourism aimed at reducing biodiversity loss, habitat preservation and work on community-based conservation programs and initiatives for sustainable livelihoods for regional residents. Future research can help preserve the Sariska Tiger Reserve and its ecosystems by building on the findings of this spatiotemporal study. This would guarantee the iconic tiger species' unwavering survival as well as the region's overall biodiversity and boost ecotourism which will make local people an important stakeholder in preserving the nature and biodiversity.

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