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INTEGRATING ECOTOURISM AND SUSTAINABILITY: A STRATEGIC FRAMEWORK FOR BIODIVERSITY CONSERVATION AND SKILL-BASED LEARNING IN ODISHA UNDER THE PURVIEW OF NEP 2020

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ABSTRACT

Tourism in Odisha has evolved from a leisure-centric industry into a dynamic engine for biodiversity conservation, rural empowerment, and sustainable development. Recognized as a vital driver of economic growth, the state's tourism landscape integrates diverse sectors—including religious, wellness, and agro-tourism—while prioritizing the preservation of its unique ecological repositories. With one National Park, two Tiger Reserves, and six Ramsar Sites such as Chilika and Bhitarkanika, Odisha serves as a critical frontier for nature-based solutions and environmental stewardship. Central to this transformation is the Community-Based Ecotourism (CBE) model, which gained significant momentum in 2016-17. This initiative has successfully shifted management responsibilities to over 670 local community members, predominantly rural women and tribal populations, across 51 destinations. By linking livelihood security directly to the health of wildlife sanctuaries and national parks, the model fosters a "natural process" of conservation. Furthermore, the state is aligning with the National Education Policy (NEP) 2020 by promoting educational tourism. Through field studies, eco-clubs, and government internships, Odisha is bridging the gap between academic theory and practical environmental management, ensuring that the next generation is equipped with the skills necessary for sustainable tourism leadership.

Despite these strides, challenges regarding financial transparency and strategic community empowerment remain. Addressing these gaps through structured training, value-added courses, and improved governance is essential for long-term resilience. This study highlights how the integration of community involvement and academic curricula can create a self-sustaining ecosystem that protects Odisha's rich biodiversity while ensuring inclusive economic growth. By harmonizing human progress with ecological integrity, Odisha provides a scalable blueprint for sustainable ecotourism in India.

KEYWORDS: Tourism, Nature, Sustainable Development, Biodiversity Conservation, Community-Based Ecotourism, Educational Tourism, Odisha.

INTRODUCTION:

Ecotourism has gained prominence worldwide due to growing concerns over the loss of cultural heritage and natural ecosystems. While tourism contributes to economic development, it can also have adverse effects on protected areas and local communities if not managed responsibly (Wearing & Neil, 1999). This article explores how ecotourism can be leveraged to protect Odisha's environment while benefiting indigenous communities.

Tourism in Odisha has expanded significantly, particularly during peak travel seasons (see Fig. 1) (Dept. of Tourism, Odisha, 2022). However, unregulated tourism can pose a threat to the state's biodiversity and natural beauty. A viable solution is to encourage both the public and the government to adopt ecotourism, which has a lower environmental impact compared to conventional tourism. By implementing conservation initiatives and promoting ecotourism, Odisha can safeguard its rich natural heritage while also enhancing the livelihoods of local communities.

According to the United Nations (2010), tourism is "a social, cultural, and economic phenomenon related to the movement of people to places outside their usual place of residence, pleasure being the usual motivation." Ecotourism, however, differs from mainstream tourism, and there is no universally accepted definition for it (Hvenegaard, 1998). Hetzer (1965), one of the earliest proponents of ecotourism, outlined four key principles: minimising environmental impact, respecting host cultures, maximising benefits to local communities, and ensuring tourist satisfaction (Boo, 1992; Lindberg, Enriquez, & Sproule, 1996; Blamey, 2001).

For Odisha, achieving conservation and environmental goals through ecotourism is imperative, as suggested by various experts (Panigrahi and Sethi; 2013). The state's unique biodiversity, encompassing sites such as Bhitarkanika National Park, Simlipal Tiger Reserve, and Chilika Lake, makes it an ideal location for ecotourism initiatives. Sustainable tourism policies can help mitigate environmental degradation while providing economic opportunities for indigenous communities, including the Juang, Dongria Kondh, and Santal tribes.

Ecotourism in recent decade plays a vital role in minimizing negative environmental impacts while promoting conservation, sustainability, and community development in Odisha. It's beyond a shadow of a doubt Odisha has diverse landscapes—including the Chilika Lake, Simlipal Biosphere Reserve, Bhitarkanika Mangroves, and Satkosia Gorge—Odisha has immense potential for responsible tourism that supports both nature and local communities (N. Mishra, 2017). Well-planned ecotourism initiatives in the state must balance visitor experiences with conservation efforts by protecting its rich biodiversity, scenic beauty, and historical heritage, which are key attractions for domestic and international tourists (Das & Chatterjee, 2015).

Moreover, ecotourism in Odisha can significantly benefit local communities if revenue generated is reinvested in habitat and wildlife conservation efforts. Sustainable tourism initiatives, such as eco-resorts, guided nature trails, and community-run tourism enterprises, provide employment and promote traditional art, crafts, and culture. Responsible tourism management in Odisha can enhance the livelihoods of indigenous and rural populations while ensuring long-term ecological balance, making it a powerful tool for sustainable development in the region (Holden, & Sparrowhawk, 2002; Das & Chatterjee, 2015; Inamdar, Dash, 2023).

The implementation of effective long-term sustainable ecotourism management plans is crucial to ensuring economically viable ecotourism operations while minimizing negative impacts on local communities, wildlife, and natural habitats. These plans aim to mitigate social and environmental disturbances, reduce economic leakage, increase environmental awareness among tourists and residents, and promote activities with educational value (GoI, 2022). Furthermore, these support the preservation of Odisha's rich cultural heritage and create employment opportunities for local communities by involving them directly in ecotourism management (Indapurkar & Berry; 2015; Mishra, Rout; 2016; Mohanty, Sadual

and Samal 2019; Mohapatra; Behera; & Pattanayak; 2019) Engaging local populations in ecotourism management aligns their interests with conservation goals and fosters sustainable development (Dehoorne, Murat, & Petit-Charles, 2010; Lequin, 2002; Waligo et al., 2015). Additionally, providing educational programs for local communities can enhance their understanding of ecotourism's benefits and help they adapt socially and economically to this growing sector (Das & Chatterjee, 2015; Wearing & Neil, 2009). Such programs, targeted at tourists, tourism operators, and local populations, can improve awareness about Odisha's unique biodiversity, thereby reducing negative visitation impacts and strengthening conservation efforts for the state's wildlife and natural landscapes (Pegas et al., 2013; Queiroz et al., 2014). Ultimately, ecotourism in Odisha has the potential to drive conservation through economic incentives (Sethy & Senapati, 2023), with active community involvement ensuring long-term sustainability and success (Stronza & Pegas, 2008).

METHODOLOGY

Research Design

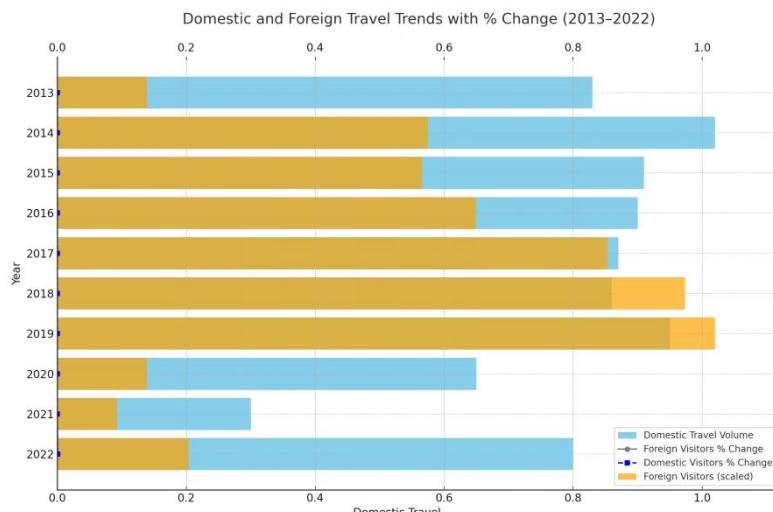
This study adopts a quantitative research approach, utilizing secondary data to analyze the impact of ecotourism in Odisha. A descriptive and analytical research design has been employed to examine trends, relationships, and patterns in ecotourism development and its environmental and socio-economic implications (Creswell, 2014).

Data Collection

The study is based on secondary data collected from multiple government and institutional sources, including reports from the Department of Tourism, Department of Forest, Environment and Climate Change, Government of Odisha, the Odisha Statistical Bulletin (2013–2023), and publications from the Odisha Tourism Development Corporation. Additionally, peer-reviewed journals, books, and relevant research articles have been reviewed to provide theoretical and empirical support.

LIMITATIONS

The study relies on secondary data, which may have inherent limitations such as data availability, accuracy, and potential biases in reporting. Furthermore, the findings may not capture real-time changes in ecotourism dynamics due to data constraints (Bryman, 2012).



(OTDC, Annual Report 2024)

Tourism in Odisha during peak travel seasons

ODISHA TOURISM

Tourism has emerged as an important industry in Odisha, contributing significantly to the state's revenue from both domestic and international visitors. The Government of Odisha first introduced tourism during the 3rd Five-Year Plan and gave it a major boost in the 5th Plan. The Department of Tourism was established in 1973 and restructured in 1995. Odisha Tourism Development Corporation (OTDC) was set up in 1979 to promote tourism infrastructure and services.

Odisha is widely known for its cultural and natural attractions. Key destinations like Bhubaneswar, Puri, and Konark attract thousands of tourists every year. The state is blessed with rich biodiversity (Table 1), stunning temples, serene beaches, wildlife sanctuaries, waterfalls, and historical monuments. Places such as Dhauli, Ratnagiri, and Lalitgiri are famous for Buddhist heritage, while Udayagiri and Khandagiri are known for Jain monuments.

There is vast potential for promoting religious, rural, adventure, medical, and eco-tourism in Odisha. Events like the Hockey World Cup 2018 showcased the state as a hub for sports tourism. Wildlife hotspots like Chilika Lake and Bhitarkanika Sanctuary are major attractions, although infrastructure development is still lacking in many areas.

Table 1: Wildlife Diversity of Odisha (Wildlife Odisha 2024 OFD)

Wildlife Diversity in Odisha	
No. of Species	State of Odisha
Mammals	114
Birds	537
Reptiles	131
Amphibian	29
Fishes	>800

With about 500 km-long coastline, Odisha has many unexplored beaches such as Talasari, Chandipur, and Gahirmatha. Museums, including the Odisha State Museum and Tribal Museum, add to the tourist appeal. Eco-tourism projects, managed by the Odisha Forest Development Corporation, offer alternative livelihood options for local communities.

Improving infrastructure, rail and air connectivity, and completing projects like Shamuka and ABHADA will further boost tourism. The state's new tourism tagline, "*India's Best Kept Secret*," aptly captures the hidden treasures waiting to be discovered.

Panigrahi, 2005 article, "*Development of Eco-tourism in the Tribal Regions of Orissa: Potential and Recommendations*," highlights Odisha's potential for ecotourism through its rich ecological and cultural heritage. He emphasizes involving tribal communities as equal partners in ecotourism to ensure their livelihoods, cultural preservation, and environmental protection. The author stresses the need for infrastructure development in tribal areas to attract visitors. He also urges the government to protect indigenous rights and shield their culture and environment from external influences, promoting inclusive and sustainable development rooted in respect for local traditions and ecological balance.

The association of sustainable ecotourism and higher education in Odisha, India, is pivotal for promoting environmental conservation, socio-economic development, and cultural preservation. Higher Education Institutions (HEIs) in Odisha NEP 2020 are instrumental in fostering this synergy through various means:

Knowledge Creation and Dissemination: Odisha's universities and colleges offer specialized programs in environmental studies and tourism management, equipping students with the expertise to develop and manage ecotourism initiatives responsibly.

Capacity Building and Skill Development: HEIs provide training that enhances local communities' abilities to participate effectively in ecotourism projects. For instance, studies

in the Bhitarkanika Wildlife Sanctuary have shown that community-based ecotourism can lead to inclusive development by involving local populations in conservation efforts and tourism services. (Mohanty; 2024)

Community Engagement and Participatory Research: Academic institutions engage with indigenous communities to integrate traditional knowledge with scientific research, promoting sustainable practices. Research in Western Odisha highlights the importance of incorporating local cultures into ecotourism to create an enabling environment for community participation. (Pujar; 2024)

Policy Advocacy and Implementation Support: Research conducted by HEIs informs policymakers about best practices and challenges in sustainable ecotourism. The Odisha government's ecotourism policy emphasizes responsible travel that conserves the environment and improves local well-being, aligning with academic recommendations (OFD; 2025).

Sustainability Goals Alignment: By promoting ecotourism, HEIs contribute to several Sustainable Development Goals (SDGs), including quality education (SDG 4), decent work and economic growth (SDG 8), responsible consumption and production (SDG 12), and life on land (SDG 15).

CHALLENGES IN ECOTOURISM

Tourism in Odisha holds significant potential, yet faces critical challenges that hinder its development. Limited connectivity, particularly the absence of railway links in ten districts, restricts tourist access (Government of Odisha, 2024). Inadequate infrastructure, including a shortage of international-standard hotels and poor medical and safety facilities, further discourages visitors (Panigrahi, 2005). Moreover, incidents of harassment, theft, and environmental degradation negatively affect Odisha's tourism image (Mishra & Behera, 2019). Despite the collection of fees at sites, cleanliness and waste management remain poor. The lack of effective Public-Private Partnerships also hampers sustainable tourism development (Patra, 2020).

A pivotal contribution of HEIs is their ability to conduct ecological and social research, as shown in the recent study by Samal (2024), which utilized the DPSIR (Drivers, Pressures, State, Impact, Response) model and the Sustainable Livelihood Framework (SLF) to evaluate

tourism's impact in the Chilika region. The study underscores the absence of carrying capacity assessments in key sites like Rambha and Barkul—areas that can greatly benefit from academic involvement in ecological monitoring, impact analysis, and data-driven policy recommendations.

Moreover, HEIs can drive inclusive tourism development by engaging with local communities through participatory research and capacity-building programs. Samal (2024) emphasizes the underrepresentation of fishing communities and women in Chilika's ecotourism sector—gaps that can be addressed through targeted skill development, entrepreneurship support, and gender-sensitive policy research led by academic institutions.

HEIs also have the responsibility and capability to advocate for eco-friendly innovations, including clean energy technologies, biodegradable infrastructure, and sustainable waste management systems. Collaborative research between engineering, environmental science, and business faculties can lead to scalable green solutions for tourist regions like Chilika.

Finally, the promotion of local crafts, culture, and cuisine—key to enriching tourist experiences—can be supported through university-led initiatives such as cultural documentation, market research, and community exhibitions. Embedding environmental education at grassroots levels, especially through outreach programs in schools and colleges, is essential for cultivating a conservation-oriented mindset among local populations.

CHALLENGES AND OPPORTUNITIES IN HIGH SCHOOL AND HIGHER EDUCATION TOURISM CURRICULA: A FOCUS ON TRIBAL ODISHA

Tourism education at both high school and higher education levels in Odisha, especially in tribal-dominated regions, faces a set of complex challenges—ranging from outdated curricula and inadequate infrastructure to limited local contextualization. These challenges are magnified in tribal areas where tourism, particularly ecotourism, has the potential to become a powerful tool for sustainable development and community empowerment.

One of the most pressing issues is the lack of foundational training and discipline-specific preparation at the high school level. Students often encounter the field of tourism without a structured understanding of its principles or economic value. As Luka and Donina (2012) point out, this disconnect between tourism education and industry needs is a global issue, but it is even more pronounced in developing regions like tribal Odisha. The absence of one-on-

one mentorship during internships, due to limited staffing and resources, often results in discipline problems and poor practical outcomes.

At the college level, particularly in institutions located in tribal regions such as Koraput, Kandhamal, and Mayurbhanj, tourism education can be a game changer. These areas are rich in biodiversity, tribal heritage, and cultural tourism potential—making them ideal sites for ecotourism development. The National Strategy for Ecotourism (2022) emphasizes integrating ecotourism into higher education curricula, especially for communities that live close to nature. This is particularly relevant in Odisha, where tribal populations have lived sustainably for generations and can offer authentic ecotourism experiences if properly trained.

However, most colleges in these regions lack structured programs in sustainable tourism, environmental management, or ecotourism. The Centre for Environment Education (CEE) has developed educational materials and partnered with institutions across India to bring environmental education into higher studies, including through pre-service teacher training programs. Adopting similar collaborations in Odisha could strengthen tourism education and make it more community-centered.

Infrastructure challenges persist at all levels of tourism education. High schools and colleges in tribal districts often lack access to modern training equipment, kitchens for hospitality programs, or labs for environmental studies. As a result, students are expected to bring their own materials—an unrealistic demand in economically weaker regions. This leads to educational disparities and prevents students from acquiring the hands-on skills needed for the tourism industry.

Internships and field experiences are also fraught with difficulties. In Odisha, students are frequently placed in exploitative work environments where they lack legal protections. This situation is worse in remote areas where oversight is minimal. Furthermore, internship periods are often not counted toward formal employment or insurance benefits, a problem also highlighted by Gupta and Dash (2012) in their study of tourism education in India. Without legal reforms and protective legislation, students remain vulnerable despite contributing significantly during internships.

Nonetheless, there is immense untapped potential in Odisha's tribal belts for aligning ecotourism education with local livelihoods. Institutions such as the Sálim Ali Centre for Ornithology and Natural History (SACON) have demonstrated how partnerships with local colleges can promote biodiversity education, which is directly linked to nature-based tourism. By creating similar regional centers of excellence in Odisha, education can be adapted to empower tribal youth with skills in birdwatching tours, eco-guiding, sustainable craft marketing, and forest-based hospitality.

ECOTOURISM EDUCATION IN TRIBAL ODISHA: A PATH FORWARD

India's National Strategy for Ecotourism (2022) calls for the integration of sustainable tourism into educational curricula. It specifically recommends incorporating ecotourism concepts into both school and college-level programs to raise awareness and create employment pathways. Institutions like the Centre for Environment Education (CEE) have already partnered with higher education institutes to develop environmental education content tailored to regional contexts.

In tribal Odisha, the potential is immense:

- Colleges in rural and tribal belts can develop region-specific ecotourism courses focusing on forest ecology, tribal culture, local crafts, and eco-guiding.
- Programs like pre-service teacher training in environmental education (CEE, 2022) can be expanded to produce qualified ecotourism educators.
- Community-based models, like those seen in Japan and Sweden, can be localized through partnerships with Odisha Tourism, NGOs, and forest departments.
- Such initiatives could empower local youth—especially those who are bilingual in Odia and tribal dialects—with employable skills while promoting environmental stewardship.

CONCLUSION:

Odisha's diverse ecological and cultural landscapes—from the wetlands of Chilika Lake to the tribal heartlands of Koraput and Kandhamal, and the dense biodiversity of Similipal Biosphere Reserve—offer rich potential for sustainable ecotourism. When guided by circular economy principles, such ecotourism models can foster environmental regeneration, local economic resilience, and cultural preservation, creating a self-sustaining and inclusive development pathway (Ghisellini, Cialani, & Ulgiati, 2016).

However, unlocking this potential requires active participation from Higher Education Institutions (HEIs). These institutions are uniquely positioned to lead research, innovation, and capacity-building initiatives that integrate circular economy frameworks into ecotourism planning. For instance, HEIs can conduct carrying capacity assessments and impact evaluations in sensitive zones like Similipal's tiger habitats, Chilika's birding areas, and Koraput's tribal tourism circuits (Samal, 2024). Such evaluations are essential to ensure tourism activities do not degrade the very ecosystems they depend on.

HEIs can also support the development and adoption of clean technologies, such as solar-powered transport in Chilika, low-impact eco-lodges in Kandhamal, and decentralized waste-to-energy models in Koraput. These innovations not only reduce the environmental footprint of tourism but also contribute to local circular economic loops, where waste is minimized and resources are reused (D'Amato et al., 2017).

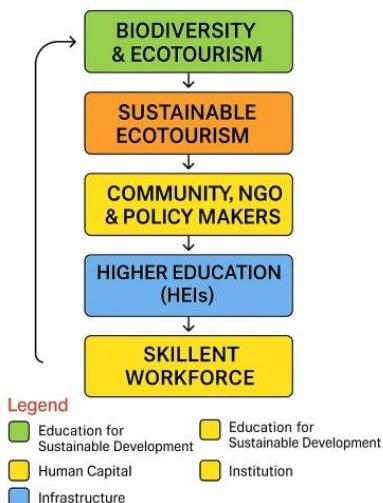
Moreover, HEIs serve as vital hubs for education and community engagement. By embedding sustainable tourism and circular economy principles into academic curricula, they prepare a workforce equipped to design and manage ecotourism systems that prioritize both conservation and livelihood generation. Extension programs and field-based training can empower indigenous communities, women, and youth in these regions to become active participants in the ecotourism value chain—through skill-building in areas such as sustainable hospitality, organic agriculture, eco-guiding, and craft entrepreneurship (Murray, Skene, & Haynes, 2017).

In culturally rich districts like Kandhamal and Koraput, where traditional ecological knowledge is deeply rooted, HEIs can facilitate the documentation and promotion of indigenous practices, festivals, and art forms—thereby enriching the tourist experience while preserving intangible heritage. Simultaneously, they can support policy advocacy and multi-stakeholder dialogues to align ecotourism strategies with broader state and national sustainability goals.

In conclusion, a sustainable ecotourism model that incorporates circular economy principles and the active involvement of Higher Education Institutions holds the key to transforming Odisha's tourism sector. By combining scientific research, local participation, and eco-innovation, Odisha can build a regenerative tourism economy that not only safeguards its

natural and cultural wealth but also empowers its communities—positioning the state as a leader in sustainable development.

PATH TO CIRCULAR ECONOMY



This model provides a holistic strategy for Odisha's sustainable ecotourism sector by integrating biodiversity conservation, community participation, education, policy-making, and infrastructure development into a circular economy approach. The inclusion of HEIs, NGOs, and policy-makers ensures a multi-stakeholder framework that balances economic growth, environmental sustainability, and social equity.

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