

# Sustainable Tourism in Eco-Sensitive Zones for Tribal Settlements: A Framework for Community-Led Development

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*Abstract* — This paper explores sustainable tourism development within eco-sensitive zones (ESZs), with emphasis on tribal settlements in ecologically vulnerable landscapes such as India's Western Ghats. ESZs serve as critical buffer regions encircling protected areas where regulated low-impact tourism can curb habitat fragmentation and deforestation while channelling economic benefits to indigenous communities through homestays and guided eco-trails. The study integrates the three core pillars of sustainable tourism—environmental protection, socio-cultural preservation, and economic viability—as outlined in the National Strategy for Sustainable Tourism 2022. It examines challenges including the tension between rising visitor numbers and the need to protect fragile ecosystems and traditional livelihoods of tribes like the Irula, Kurumba, and Muduga in Attappady, Palakkad. Case studies of the En Ooru Tribal Heritage Village (Wayanad), the Kayapo People (Amazon), and the Maasai Tribal Wild Lands (East Africa) are analysed to derive a replicable global model. A primary survey from Attappady validates the framework. The proposed model embeds carrying-capacity assessments, eco-friendly infrastructure, benefit-sharing mechanisms, and policy recommendations aligned with national guidelines and UN SDGs.

**Keywords:** Eco-Sensitive Zones, Sustainable Tourism, Tribal Communities, Attappady, Western Ghats, Community-Based Tourism, Ecotourism Policy, Biodiversity Conservation, Cultural Preservation, Tourism Governance

## I. INTRODUCTION

Tourism, while one of the fastest-growing industries globally, often exerts immense pressure on fragile ecosystems and indigenous communities. Eco-sensitive tourism zones (ESTZs) play a crucial role in balancing economic development with ecological preservation. These demarcated areas regulate human activities to minimise environmental degradation while promoting sustainable livelihoods. Within such regions, tribal settlements hold unique significance—indigenous communities serve as custodians of biodiversity and traditional knowledge, and represent living cultures that enrich the tourism experience [3].

When planned and managed responsibly, ESTZs with tribal settlements can become models of sustainable tourism where conservation and community empowerment go hand in hand. Such initiatives provide ecological preservation, cultural exchange, and economic inclusion of marginalised groups while mitigating the negative impacts of mass tourism. Integrating tribal participation in decision-making, resource management, and tourism enterprises ensures development remains inclusive, respectful, and ecologically sound [4].

## A. Background

The National Wildlife Action Plan (2002-2016) of the Ministry of Environment, Forest and Climate Change (MoEFCC) directed state governments to designate land within a 10-kilometre radius of national parks and wildlife sanctuaries as Eco-Sensitive Zones (ESZs) under the Environment (Protection) Act, 1986. An Eco-Sensitive Tourism Zone (ESTZ) refers to a designated area around protected regions where tourism activities are carefully planned and regulated to protect fragile ecosystems while promoting sustainable development [3].

Sustainable Tourism is defined as tourism that fully considers its current and future economic, social, and environmental impacts [4]. It rests on three fundamental pillars: (1) Environmental Sustainability—promoting responsible use of natural resources and safeguarding biodiversity; (2) Socio-Cultural Sustainability—preserving cultural authenticity of host communities and fostering intercultural respect; and (3) Economic Sustainability—ensuring viability of tourism-related activities, equitable socio-economic benefits, fair employment, and poverty reduction.

## B. Research Objectives

The study aims to: (i) identify principles and practices relevant to eco-sensitive tribal zones; (ii) assess the role of tribal communities in ownership, management, and benefit-sharing of tourism; (iii) evaluate socio-economic and cultural impacts on tribal livelihoods and heritage; (iv) assess environmental conservation measures and policy frameworks; and (v) propose a community-driven, ecologically responsible tourism model replicable across India's tribal ESZs.

## II. ECO-SENSITIVE ZONES AND LEGAL FRAMEWORK

Protected Areas (PAs) such as National Parks, Wildlife Sanctuaries, and Tiger Reserves are the cornerstone of India's biodiversity conservation. ESZs are buffer areas around PAs that function as 'shock absorbers'—regulating land-use in the periphery so that negative impacts of urbanisation, deforestation, mining, and pollution do not reach core conservation areas [1].

ESZs are declared under Section 3(2)(v) of the Environment (Protection) Act, 1986. Activities are classified into three categories: (1) Permitted—agriculture, organic farming, rainwater harvesting, and renewable energy use; (2) Prohibited—commercial mining, sawmills, polluting industries, hydroelectric projects, and high-impact tourism activities like hot-air balloon rides; and (3) Regulated—establishment of hotels and resorts, use of natural water, and widening of roads [1].

### A. Policy Evolution

Key milestones in ESZ policy include: the National Wildlife Action Plan (2002) recommending a 10 km buffer; the National Board for Wildlife (2005) advocating a site-specific approach; the Wildlife Protection Act amendment (2006) introducing Tiger Reserve buffer zones; MoEF&CC guidelines (2011) detailing the ESZ notification procedure; and the Supreme Court order (2022) mandating a minimum 1 km ESZ around all PAs [1].

### B. Western Ghats as a Biodiversity Hotspot

The Western Ghats (Sahyadri Hills) stretch approximately 1,600 km along India's west coast and constitute one of only 36 globally recognised biodiversity hotspots. The region is characterised by high endemism (species like the Lion-tailed macaque and Nilgiri tahr), ecological fragility (regulating monsoon rainfall and providing water security), and exceptional habitat diversity including tropical evergreen forests, sholas, wetlands, and lateritic plateaus [2].

The Western Ghats Ecology Expert Panel (WGEEP, 2011) proposed a graded protection approach: ESZ-I (highest sensitivity, strict prohibitions), ESZ-II (moderately disturbed areas requiring rigorous EIA), and ESZ-III (human-dominated areas with sustainability mandates). The Forest Rights Act (FRA), 2006, safeguards rights of forest-dwelling Scheduled Tribes and must be reconciled with ESZ restrictions to avoid rights violations [2].

## III. CASE STUDIES

### A. En Ooru Tribal Heritage Village, Wayanad

En Ooru Tribal Heritage Village is a 25-acre community-managed site in Pookode, Wayanad, within the Western Ghats ESZ. It features traditional huts, a tribal market, art and craft workshops, an amphitheatre for cultural performances, and a tribal cafeteria serving organic cuisine. Performances by 20+ tribal communities—Thudi Thalam, Mavilan Pattu, tribal archery—attract significant visitor inflow while creating direct employment for over 50 community members [7].

The community-led approach guarantees cultural authenticity and long-term sustainability. Key takeaways: tribal involvement in design and operations ensures ownership; organic farming and medicinal gardens demonstrate traditional practices; skill development in eco-tourism and hospitality creates sustainable jobs; and the model is directly replicable in other tribal ESZs.

### B. The Kayapo People, Southeast Amazon

The Kayapo occupy approximately 105,000 km<sup>2</sup> in the southeastern Amazon (Xingu Basin), home to about 7,000 inhabitants in 18 villages. Satellite imagery since the 1980s reveals that deforestation halts at Kayapo territorial borders—creating a 'green island' amid widespread destruction. Their success stems from robust communal governance, a traditional warrior ethos, and alliances with NGOs.

Communal decision-making governs resource use, with chiefs selected on the basis of ritual knowledge, oratory, and moral authority. Sustainable livelihoods include non-timber forest products (Brazil nuts, oils, honey) and handicraft cooperatives. Tourism potential exists through

cultural immersion and guided forest walks, but remains limited by remote access and community-determined cultural boundaries.

### C. Maasai Tribal Wild Lands, East Africa

The Maasai traditionally inhabit semi-arid rangelands in Kenya and northern Tanzania. Their time-honoured rotational paddocking, seasonal grazing movements, and collective ownership have shaped the Mara-Serengeti ecosystem and sustained vital wildlife migrations. The Mara region, with over 4,000 tourist beds, generates substantial revenue through conservancies linked to the Masai Mara National Reserve.

However, post-independence privatisation of land has disrupted communal practices, fragmenting grazing corridors. Key challenges include elite capture of tourism revenues, human-wildlife conflict, cultural erosion as youth migrate to cities, and climate-driven drought stress. The Maasai case underscores the urgent need to address land tenure and equitable benefit-sharing to preserve both social and environmental sustainability.

### D. Comparative Analysis

Across all three cases, common success factors are: (i) active community participation and self-governance; (ii) cultural integrity embedded in tourism programming; (iii) equitable economic distribution aligned with conservation; (iv) traditional ecological knowledge combined with modern methods; and (v) context-specific, non-generic solutions. Persistent challenges—development pressures, land tenure conflicts, and socio-economic inequality—require proactive governance, participatory planning, and supportive policy frameworks.

## IV. STUDY AREA: ATTAPPADY, PALAKKAD

Attappady is located in the Mannarkkad taluk of Palakkad district, Kerala—a major tribal block covering approximately 745 sq. km along the Kerala-Tamil Nadu border, adjacent to the Nilgiri Hills and the Western Ghats. The area includes the Silent Valley National Park and its buffer zone, making it an ecologically sensitive landscape with significant tourism potential in eco-tourism, cultural tourism, and adventure travel.

### A. Population and Tribal Composition

Total population is approximately 68,824, of whom 27,121 (41%) belong to Scheduled Tribes distributed across 193 hamlets (oorus). Three major tribal groups are: Irulas (77.5%), Kurumbas (13.3%), and Mudugas (9%), each with distinct cultural practices and livelihoods. Overall literacy stands at 77.6% while tribal literacy is approximately 38%. Around 71.4% of tribal households depend on daily wage labour, supported by schemes such as MGNREGP [6].

### B. Socio-Economic Context

Attappady's tribal communities are among the most socio-economically marginalised in Kerala. Traditional livelihoods—shifting cultivation, millet farming, and collection of non-timber forest products—no longer meet subsistence needs. About 49.2% of households live in pucca

houses; firewood remains the primary cooking fuel for 68.8% of households, reflecting continued forest dependence.

The Vattalakki Cooperative Farming Society (VCFS), supported under NABARD's Bamboo Bank Project, provides a successful model of tribal enterprise integrating bamboo cultivation, handicraft production, and tourism market linkages—including retail outlets at tourist destinations and a traditional tribal cafe.

### C. Primary Survey Findings

A primary survey using a 5-point Likert scale was conducted among 32 tribal and non-tribal respondents across five sustainability dimensions. Results: strong community participation and cultural preservation were affirmed (social); tourism creates jobs but equitable distribution is lacking (economic); significant concerns about environmental damage and resource strain (environmental); facilities and local management have improved (facility); respondents acknowledge economic leakage, cultural commodification risk, and growing tourism dependency as major challenges (problems dimension).

## V. A GLOBAL SUSTAINABLE TOURISM MODEL FOR TRIBAL ESZS

Integrating literature, case study insights, and Attappady field findings, a five-pillar framework is proposed, validated against the National Strategy for Sustainable Tourism (2022) and UN SDGs:

- **Governance and Rights:** Recognise and secure tribal land and resource rights; create village/ooru tourism councils with legal roles in planning, monitoring, and benefit-sharing; integrate into ESZ Zonal Master Plans and park committees for joint decision-making.
- **Ecological Safeguards:** Zone ESZ into strict conservation cores, low-impact tourism zones, and community-use areas with carrying-capacity limits; permit only eco-friendly, small-scale infrastructure using local materials; enforce waste, water, and energy standards.
- **Culture and Social Wellbeing:** Treat tribal culture as living heritage; require community-approved protocols for tourism performances and guided visits; reinvest tourism revenues into education, health, and cultural centres.
- **Inclusive Livelihoods and Local Economy:** Prioritise community enterprises and cooperatives—homestays, guides, crafts, agro-ecological products, bamboo/NTFP value-addition—as primary tourism service providers; ensure fair pricing, local procurement, and transparent revenue-sharing to minimise economic leakage.
- **Facilities, Skills, and Monitoring:** Provide basic infrastructure (water, sanitation, trails, safety, information centres) at eco-sensitive scale; institutionalise continuous capacity building for tribal youth and women; adopt sustainability certification; track SDG-linked indicators for adaptive management.

### A. SDG Alignment

The model contributes to nine UN Sustainable Development Goals: SDG 1 (No Poverty), SDG 6 (Clean Water and

Sanitation), SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 15 (Life on Land), SDG 16 (Peace, Justice and Strong Institutions), and SDG 17 (Partnerships for the Goals).

## VI. CONCLUSION

This study demonstrates that sustainable tourism in eco-sensitive tribal zones is viable and can generate significant social, economic, and ecological benefits—provided it is anchored in community empowerment, ecological safeguards, and cultural integrity. The cases of En Ooru, Kayapo, and Maasai reveal that no single model fits all contexts, but common principles of inclusive governance, equitable benefit-sharing, and low-impact infrastructure are universally applicable.

Attappady's analysis reveals a landscape where rich biodiversity and cultural diversity coexist with persistent poverty and livelihood insecurity. The proposed five-pillar framework—validated through primary survey data and grounded in India's national policy architecture—provides a replicable blueprint for tribal ESZs across the country. Tourism must remain a complementary, not dominant, pillar of development, aligned with tribal aspirations for self-reliance and dignity.

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