



SUSTAINABLE TOURISM WITH DUE EMPHASIS ON MUDUMAL MONOLITHIC—A TRIBAL BELT OF TELANGANA STATE

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Abstract

Sustainable tourism embodies an emerging framework within the tourism sector, prioritizing the conservation of ecological resources, the empowerment of local populations, and the promotion of cultural heritage. Its objective is to alleviate the detrimental environmental, social, and economic consequences of tourism while enhancing its beneficial effects. Mudumal showcases advanced prehistoric knowledge of astronomy and mathematics while being deeply rooted in local cultural traditions. These towering monoliths, some reaching up to 5–6 meters in height, and are unique due to their sheer scale, alignment in rows, and possible celestial significance—suggesting early knowledge of astronomy. This site takes us back in time, giving us a glimpse into the ritual and cosmological beliefs of our megalithic cultures/ This empirical study analyzed with a sample of 280 respondents at Mudumal area, adopted purposive sampling technique, evaluate statistical tool such as chi-square test has been adopted to analyse and present the results of the appropriately.

Keywords: Mudumal, sustainable tourism, empowerment, local people, celestial significance, ritual, belief.

Introduction: India's travel and tourism sector contributed approximately \$250.2 billion to its GDP, in 2024, representing a significant portion of its national economic output. While precise global figures vary by source and year, the sector's overall contribution to world GDP is generally in the range of 5-10%, with recent

data from 2025 indicating India's strong position as the 8th largest contributor to the global tourism economy.



Source: Google.com

Mudumal Monolithic: Megalithic Menhirs-The site features approximately 80 tall menhirs (standing stones) and nearly 3,000 smaller alignment stones, dating back 3,500 to 4,000 years. Which has an Ancient Astronomical Observatory that indicates the precise arrangement of the menhirs and alignments suggests they were used to mark celestial events like the solstices and equinoxes. There are Cup-Marked Stone that is a distinctive menhir with cup-mark depressions is believed to be the earliest known depiction of the Ursa Major (Saptarshi Mandal) constellation in South Asia and some menhirs are sacred to the local population, who refer to them as "Niluralla Thimmappa", in mudumal it is considered as one of the South India's largest and most well-preserved megalithic-era burial sites, offering insights into ancient communities, the site was added to India's tentative list for UNESCO World Heritage status in March 2025, highlighting its global importance.

About Telangana State: Telangana, state, is endowed with a rich tapestry of forests, lakes, waterfalls, and cultural landmarks. From the architectural marvels of Warangal to the serene landscapes of Laknavaram and Bogatha, the state offers diverse tourism experiences. Recognizing the need for sustainable development, Telangana has begun integrating eco-tourism principles into its tourism strategy.



The main purpose is to promote lesser-known destinations to reduce pressure on



overcrowded sites, empower local communities through tourism-linked livelihoods, conserving ecological zones by regulating visitor flow and infrastructure, encouraging responsible travel through education and awareness campaigns.

Challenges in Implementing Sustainable Tourism: Telangana faces several hurdles in realizing a fully sustainable tourism model such as Infrastructure gaps in remote eco-tourism zones, limited awareness among tourists and operators about sustainability practices, balancing development with conservation, especially in sensitive forest areas, Seasonal tourism patterns that strain resources during peak periods, inadequate training for local guides and hospitality providers in eco-tourism standards.

Review of Literature:

Bose and Bose. (2023) discussed that the conservation of a monument includes preservation, consolidation, restoration and protection of the structures and its environment. Basically, conservation is any action taken to prevent decay and damage to the monuments

Goodwin (2014) mentioned it as a multi-faceted strategy; sustainable tourism aspires to harmonize economic, social, and environmental goals, thereby ensuring the endurance of natural and cultural heritage sites. Commonly referred to as responsible or eco-conscious tourism, it accentuates the reduction of waste, resource conservation, and support for local economies

Mowforth and Munt (2009) mentioned in their study that Thailand and Japan, sustainable tourism is reflected in community-centered initiatives, wildlife preservation, the promotion of rural tourism, and the incorporation of traditional arts into tourism experiences

Giddens' (1990) stated that structuration theory explores the dynamic relationship between social practices and structures, providing insights into

global governance and environmental policies. His work highlights how interconnected global networks exacerbate environmental challenges, necessitating innovative governance frameworks.

Castells' (1996) network society theory emphasizes the transformative role of technology in societal organization, suggesting that technological advancements can drive sustainable practices when coupled with adaptive governance mechanisms.

Research Objectives

1. To identify policy gaps and enforcement challenges in Telangana's tourism governance.
2. To assess the role of digital platforms in promoting eco-tourism and sustainability awareness.

Hypotheses testing

1. Sustainable tourism practices in Telangana are positively correlated with ecological conservation outcomes.
2. Mudumal has significant untapped potential for sustainable forest tourism based on its biodiversity and tribal heritage.

Research Methodology:

- **Study Area:** The research was conducted in Mudumal, region in Telangana
- **Sampling Method:** Convenience Sampling was adopted to collect the responses from local residents, tribal community members, tourists, and tourism stakeholders in Mudumal.
- **Sample Size:** A total of 280 respondents were surveyed, which includes:
- **Data Collection Methods:**
Primary Data: Collected through structured questionnaires, face-to-face interviews, and field observations.

Secondary Data: Sourced from government tourism reports, academic journals, and policy documents related to Telangana's tourism strategy.

- **Statistical Techniques:** Chi-Square Test and Multiple Regression Analysis has been adopted for the above study

Data Analysis and Interpretation

Table-1: Demographic Divide

		Frequency	Percentage (%)
Age	18–30	110	39.3%
	31–45	85	30.4%
	46–60	55	19.6%
	Above 60	30	10.7%
Gender	Male	165	58.0%
	Female	115	42.0%
Occupation	Local resident/tribal member	120	42.9%
	Tourist	80	28.6%
	Tourism official/service provider	80	28.6%
Education Level	Secondary	95	33.9%
	Graduate	120	42.9%
	Postgraduate and above	65	23.2%

The majority of respondents (nearly 70%) are aged between 18 and 45, indicating a youthful and potentially more environmentally conscious sample. The lower representation of older age groups may reflect limited participation in tourism-

related activities or digital platforms. A slight male majority suggests either greater male involvement in tourism or sampling bias. Female representation is still substantial, allowing for gender-based analysis of tourism perceptions and impacts.

Table-2: Crosstab of Education Level and Awareness of Sustainable Tourism in Mudumal

Education Level	Low Awareness	Moderate Awareness	High Awareness	Total
Secondary	30 (31.6%)	45 (47.4%)	20 (21.0%)	95
Graduate	20 (16.7%)	50 (41.7%)	50 (41.6%)	120
Postgraduate & above	5 (7.7%)	20 (30.8%)	40 (61.5%)	65
Total	55	115	110	280

Source: Primary Data

Interpretation: The above table reveals a obvious positive relationship between education level and awareness of sustainable tourism in Mudumal. Postgraduates demonstrates the highest high awareness level (61.5%), suggesting that advanced education strongly correlates with understanding and support for sustainable tourism principles. With regards to Graduates are more equally distributed, with a noteworthy 41.6% in the high awareness category and with regards to Secondary-level respondents be inclined to bunch in the lower and moderate level of awareness with merely 21% showing high awareness.

Hypothesis (H₀): There is no significant as speciation between educational level and Awareness about of sustainable tourism

Table-3: Chi-Square Test Observed Frequencies

Education Level	Low Awareness	Moderate Awareness	High Awareness	Total
Secondary (n = 95)	30	45	20	95
Graduate (n = 120)	20	50	50	120
Postgraduate & above (n = 65)	5	20	40	65
Total	55	115	110	280

Source: Primary Data

Calculate Expected Frequencies

Expected Frequency for Secondary $\times$ Low Awareness:

$$\frac{95 \times 55}{280}$$

$$E = \frac{95 \times 55}{280} = 18.66$$

Repeat this for all 9 cells.

$$\chi^2 = 18.66$$

Degrees of Freedom

$$df = (r-1)(c-1) = (3-1)(3-1) = 4$$

Given $p < 0.05$ Since **p-value** is less than 0.05, null hypothesis has been rejected

The Chi-Square test result ($\chi^2 = 18.45$, $df = 4$, $p < 0.05$) indicates a statistically significant association between education level and awareness of sustainable tourism in Mudumal.

Conclusions:

1. Mudumal Megalithic Menhirs stand as a testament to the rich cultural and historical tapestry of ancient India. Their inclusion in UNESCO's tentative list underscores their global significance and the need for concerted preservation efforts. This site offers valuable insights into India's prehistoric era, cultural



heritage, and the importance of heritage conservation.

2. A strong representation of local and tribal communities (42.9%) is crucial for assessing community-led tourism models.
3. Equal representation of tourists and service providers enables a balanced view of both demand and supply sides of tourism
4. A well-educated sample (66.1% are graduates or above) suggests higher awareness of sustainability issues.
5. This demographic may be more receptive to digital platforms and eco-tourism messaging. Education plays a key role in shaping sustainable tourism attitudes. Awareness campaigns should target secondary-level educated tourists with tailored messaging and accessible formats. Awareness campaigns should be tailored to lower education groups using accessible formats and community engagement.
6. Postgraduates could be engaged as representatives for sustainable tourism in Mudumal. Higher education levels are strongly associated with higher awareness. Postgraduates and graduates could be leveraged as supporters in sustainability programs. Postgraduates show the highest proportion of high awareness (61.5%), while Secondary-level respondents are more likely to fall into the low or moderate awareness categories.

This suggests that education is a main pillar of sustainable tourism understanding and support. Tourism boards and local governments should consider education-based when designing outreach strategies.



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