

An Economic Analysis of Local Communities Perceptions of Multidimensional Factors Influencing Tourism Sustainability in Tirupati District

K. Sadhvik¹, Dr. P. Madhavi²

¹Research Scholar, Economics Sri Padmavati Mahila Visvavidyalayam

²Asst. Professor, Economics Sri Padmavati Mahila Visvavidyalayam

Abstract: Tourism sustainability has emerged as a critical concern for pilgrimage-driven local economies in India. This empirical study investigates the influence of economic, environmental, and social factors on the tourism sustainability perception of local communities in Tirupati - one of the most prominent pilgrimage destinations in Andhra Pradesh. Tirupati, home to the world-renowned Sri Venkateswara Temple, attract over 1.5 crore pilgrims annually, making them economically vibrant but ecologically sensitive regions. The study is based on primary data collected from 300 local residents across the district in the top footfall destinations using a structured questionnaire. A quantitative approach was adopted. Statistical tools including Mean, Standard Deviation, F-test, and Chi-square test were employed for analysis. The findings indicate that 94% of respondents acknowledge that pilgrimage tourism significantly boosts local income and employment. However, 87% highlight serious environmental concerns such as waste generation, plastic pollution, water contamination, and overcrowding. The study reveals that economic factors (Chi-square = 312.47, sig = 0.000), environmental factors (Chi-square = 287.93, sig = 0.000), and social factors (Chi-square = 341.62, sig = 0.000) all exert significant influences on how local communities perceive tourism sustainability. The study underscores the urgent need for sustainable tourism policies that balance economic growth with ecological preservation and social equity. It also recommends community-based tourism planning, green infrastructure investment, and stakeholder participation as pathways to achieving long-term tourism sustainability in these pilgrimage towns.

Keywords: Pilgrimage tourism, tourism sustainability, economic impact, local communities,

1. INTRODUCTION

Tourism, particularly pilgrimage tourism, has long served as a powerful engine of economic growth for host communities across the world. In India, where spirituality and faith are deeply embedded in the cultural fabric, pilgrimage tourism constitutes a significant component of the national tourism landscape. Sacred towns and temple cities attract millions of devotees every year, generating substantial economic activity ranging from hospitality and retail trade to transport and local services. However, the rapid and often unregulated growth of pilgrimage tourism has raised serious concerns about its long-term sustainability, particularly in terms of its effects on the environment, local livelihoods, and social cohesion.

Tirupati, located in the Tirupati district of Andhra Pradesh, is home to the Tirumala Venkateswara Temple - one of the richest and most visited religious institutions in the world. The temple receives an average of 60,000 to 1,00,000 pilgrims daily, making Tirupati one of the most heavily visited pilgrimage destinations globally.

While the economic benefits of pilgrimage tourism in these towns are widely acknowledged, their sustainability has increasingly come under scrutiny. The concentration of millions of pilgrims over short periods places enormous pressure on local infrastructure, natural resources, and public services. Issues such as solid waste management, water



scarcity, traffic congestion, air and noise pollution, and the displacement of traditional livelihoods are growing concerns among local residents. At the same time, the economic benefits of tourism are not always equitably distributed, leading to disparities between different sections of the community.

Against this backdrop, this study seeks to examine the influence of economic, environmental, and social factors on the tourism sustainability perception of local communities in Tirupati. By understanding how residents perceive and experience the various dimensions of tourism sustainability, policymakers, planners, and tourism stakeholders can formulate more effective and inclusive strategies for sustainable tourism development in these pilgrimage towns.

2. REVIEW OF LITERATURE

Tourism sustainability has been extensively studied as a multidimensional concept encompassing economic, environmental, social, and cultural dimensions. The concept of sustainable tourism, as defined by the World Tourism Organization (UNWTO), refers to tourism that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities. Sustainable tourism development requires the informed participation of all relevant stakeholders, as well as strong political leadership to ensure wide participation and consensus building.

Lal (2024) highlighted the importance of sustainable tourism in driving economic growth in India, pointing out that tourism activities are among the most significant sources of income and employment in both formal and informal sectors. The study emphasised that spiritual travel has become a key motivator for tourists from affluent countries seeking holistic and eco-friendly experiences, reinforcing the need for sustainable practices at pilgrimage destinations.

Mussa (2021) examined the positive and negative impacts of pilgrimage tourism, noting that while it provides locals with employment, income, and livelihood opportunities, it also creates problems including population density, mental stress, epidemic diseases, and the commercialisation of local culture. The study recommended the development of integrated tourism management frameworks that address both the economic and socio-environmental consequences of large-scale pilgrimages.

Naik and Lal (2013) conducted an economic analysis of Indian medical tourism, drawing parallels with pilgrimage tourism in terms of backward and forward economic linkages. Their findings demonstrated that tourism creates robust demand for ancillary industries including transport, accommodation, food and beverages, handicrafts, and communication services, thereby amplifying its economic multiplier effect on host communities.

Pandey (2021) explored the cultural and narrative dimensions of the Medaram Jatara, highlighting the role of rituals, symbols, and cultural heritage in constructing the identity of pilgrimage destinations. The study underscored that tourism management must also prioritise the preservation of intangible cultural heritage alongside physical infrastructure.

Srivastava (2009) observed that India is increasingly perceived as an ideal destination offering a unique blend of culture, history, and modern facilities, positioning it well for sustainable heritage tourism development. Gill (2002) and Kamra (2004) further noted that the tourism industry has acquired a crucial place in the global economy, with customer satisfaction and quality management being central to long-term sustainability.

Huang Che Wu (2019) conducted a study on religious tourism focusing on pilgrim experiences, motivations, risk factors, and satisfaction levels. The research concluded that improving pilgrim management by reducing risk, enhancing motivation, and upgrading service quality are essential for sustainable pilgrimage tourism development. These insights are highly relevant to the context of Tirupati, where large volumes of pilgrims require organised management systems.

Hose (2008) traced the historical evolution of tourism, noting that religious pilgrimages originating in the Middle Ages have evolved into major mass tourism phenomena driven by improvements in transport and communication. This historical perspective reinforces the need to adopt contemporary sustainable management practices that account for both the heritage significance and the mass tourism dynamics of pilgrimage sites.

3. METHODOLOGY

The study employs a quantitative approach to examine the influence of economic, environmental, and social factors on tourism sustainability perception among local communities in Tirupati. Primary data were collected from 300 local residents selected through purposive sampling across various localities.

Data collection was carried out using a structured questionnaire containing closed-ended and Likert-scale items. The questionnaire was designed to capture respondents' perceptions across three major dimensions: (i) economic factors, (ii) environmental factors, and (iii) social factors of tourism sustainability. Secondary data were sourced from government reports, the Tirumala Tirupati Devasthanam (TTD) annual reports, academic journals, and tourism statistics published by the Ministry of Tourism, Government of India.

Objectives of the Study

1. To determine the influence of economic factors on local community perception of tourism sustainability in Tirupati.
2. To evaluate the impact of environmental factors on how local residents perceive tourism sustainability in Tirupati.
3. To analyse the significance of social factors in shaping the sustainability perception of local communities in Tirupati.

Hypotheses (Null)

1. Economic factors have no significant influence on local community perception of tourism sustainability.
2. Environmental factors have no significant impact on local community perception of tourism sustainability.
3. Social factors have no significant role in shaping local community sustainability perception of tourism.

Statistical tools used in the study include Descriptive Statistics (Mean and Standard Deviation), One-Way ANOVA (F-test), and Chi-square test of independence to examine significant associations between independent variables and sustainability perceptions. The reliability of the instrument was tested using Cronbach's Alpha, which yielded a value of 0.847, indicating high internal consistency.

4. RESULTS AND DISCUSSION

Tourism Profile of Tirupati

Tirupati is one of the most visited pilgrimage cities in the world. The Tirumala Venkateswara Temple, perched atop the Tirumala hills, receives an estimated 18–20 million pilgrims annually, generating revenues exceeding Rs. 3,500 crore per year through hundi offerings, accommodation, and related services.

The faith-based tourism market in India is estimated to be valued at USD 1,180.4 million in 2024 and is projected to reach USD 4,158 million by 2030, driven by rising religious sentiment and faith-centric travel experiences (Coherent Market Insights, 2024). Andhra Pradesh, with Tirupati at its centre, plays a pivotal role in this rapidly growing market segment.

Table 1: Socio-Demographic Profile of Respondents

Category	Sub-Category	Frequency	Percentage (%)
Gender	Male	187	62.3
	Female	113	37.7

Age Group	Below 25 years	54	18.0
	25–40 years	121	40.3
	41–55 years	89	29.7
	Above 55 years	36	12.0
Education	Below SSC	62	20.7
	SSC / Intermediate	97	32.3
	Graduate	108	36.0
	Post Graduate & Above	33	11.0
Occupation	Business / Trade	118	39.3
	Agriculture	67	22.3
	Service / Employment	74	24.7
	Others	41	13.7

Source: Field Study

Table 1 presents the socio-demographic profile of the 300 respondents. The majority of respondents (62.3%) were male and 37.7% female. The largest age group was 25–40 years (40.3%), reflecting the working-age population most directly engaged in tourism-related livelihoods. Graduates constituted the largest educational category (36%), followed by SSC/Intermediate holders (32.3%). In terms of occupation, business and trade were the dominant categories (39.3%), consistent with the retail and hospitality-oriented nature of the local economy.

Table 2: Economic Factor Perception of Sample Respondents

Perception	Statistics	F-value	Sig	Result
Tourism has significantly increased income for local residents	Mean-3.48 S.D-0.87	41.23	0.000	Significant
Tourism has created new employment opportunities for local people	Mean-3.61 S.D-0.79	38.54	0.000	Significant
Tourism promotes local business and trade in Tirupati	Mean-3.72 S.D-0.68	45.17	0.000	Significant
Tourism investment has improved local infrastructure and public services	Mean-3.29 S.D-0.94	29.86	0.000	Significant
Seasonal tourism income creates financial instability for local families	Mean-3.41 S.D-0.82	33.19	0.000	Significant
Tourism revenue benefits are not equally distributed among all residents	Mean-3.18 S.D-1.02	27.43	0.000	Significant

Source: Field Study

Table 2 presents the economic factor perceptions of respondents. All six economic perception indicators yielded statistically significant F-values at the 0.000 significance level, indicating strong community awareness of tourism's economic dimensions. The highest mean score was recorded for 'Tourism promotes local business and trade' (Mean = 3.72), followed by 'Tourism has created new employment opportunities' (Mean = 3.61). This reflects a broadly positive economic outlook among local residents. However, the perception that 'Seasonal tourism income creates financial instability' (Mean = 3.41) and 'Revenue benefits are not equally distributed' (Mean = 3.18) indicate underlying concerns about income inequality and economic precarity associated with seasonal tourism patterns.

Table 3: Environmental Degradation Perspective of Sample Respondents

Perception	Statistics	F-value	Sig	Result
Tourism generates excessive plastic waste and litter at pilgrimage sites	Mean-3.58 S.D-0.71	52.31	0.000	Significant
Overcrowding of tourists adversely affects the local environment	Mean-3.44 S.D-0.83	44.62	0.000	Significant
Tourism contributes to water and air pollution in surrounding areas	Mean-3.27 S.D-0.91	36.78	0.000	Significant
Tourism activities lead to deforestation and loss of natural habitats	Mean-2.94 S.D-1.03	21.45	0.000	Significant
Tourism encourages better sanitation and waste management practices	Mean-2.71 S.D-0.98	18.93	0.000	Significant
Open defecation and poor sanitation remain major concerns during peak seasons	Mean-3.36 S.D-0.77	39.54	0.000	Significant

Source: Field Study

Table 3 presents the environmental perception of respondents regarding the impact of pilgrimage tourism. The highest F-value was recorded for 'Tourism generates excessive plastic waste and litter' (F = 52.31, Mean = 3.58), indicating overwhelming community consensus on this issue. Overcrowding (Mean = 3.44) and water and air pollution (Mean = 3.27) also emerged as significant environmental concerns. Open defecation and poor sanitation during peak seasons (Mean = 3.36) remain a persistent challenge despite government interventions. Interestingly, 'Tourism encourages better sanitation practices' recorded the lowest mean score (2.71), suggesting that positive environmental outcomes of tourism are perceived as limited. Deforestation and habitat loss (Mean = 2.94) further underscore the ecological pressures exerted by mass pilgrimage tourism.

Table 4: Social Factor Perspective of Sample Respondents

Perception	Statistics	F-value	Sig	Result
Tourism promotes cultural heritage and local traditions of Tirupati	Mean-3.81 S.D-0.62	58.47	0.000	Significant
Tourism leads to commodification and commercialisation of local culture	Mean-3.22 S.D-0.88	31.27	0.000	Significant
Tourism has improved quality of life and living standards of local residents	Mean-3.53 S.D-0.74	47.83	0.000	Significant
Pilgrimage tourism fosters social cohesion among different community groups	Mean-3.14 S.D-0.96	26.52	0.000	Significant
Tourism increases crime, traffic congestion, and social unrest in the region	Mean-2.98 S.D-1.01	22.31	0.000	Significant

Tourism creates awareness about health, hygiene, and community well-being	Mean-3.07 S.D-0.89	24.16	0.000	Significant
---	--------------------	-------	-------	-------------

Source: Field Study

Table 4 reveals the social factor perceptions of respondents. The highest mean score was recorded for 'Tourism promotes cultural heritage and local traditions' (Mean = 3.81, F = 58.47), reflecting strong community pride in the spiritual identity of Tirupati. 'Improved quality of life' (Mean = 3.53) and 'commodification of local culture' (Mean = 3.22) emerged as contrasting perceptions, illustrating the dual social impact of pilgrimage tourism. While tourism is seen as enhancing living standards and cultural visibility, it is simultaneously perceived as commercialising sacred traditions. The perception of increased crime and congestion (Mean = 2.98) points to growing social costs associated with high tourist volumes.

Table 5: Results of Hypotheses Testing (Chi-Square Test)

Hypothesis	Chi-Square Value	df	Sig. (p-value)	Result
H1: Economic factors have no significant influence on tourism sustainability perception	312.47	4	0.000	Rejected
H2: Environmental factors have no significant impact on tourism sustainability perception	287.93	4	0.000	Rejected
H3: Social factors have no significant role in shaping sustainability perception	341.62	4	0.000	Rejected

Results of Hypotheses

The chi-square test results presented in Table 5 confirm the statistical significance of all three factors. H1 (Economic factors) yielded a Chi-square value of 312.47 ($p = 0.000$), leading to the rejection of the null hypothesis. This confirms that economic factors exert a significant influence on local community perceptions of tourism sustainability in Tirupati. H2 (Environmental factors) produced a Chi-square value of 287.93 ($p = 0.000$), similarly rejecting the null hypothesis and confirming the significant relationship between environmental perceptions and tourism sustainability awareness. H3 (Social factors) recorded the highest Chi-square value of 341.62 ($p = 0.000$), indicating the strongest statistical association among the three dimensions, underscoring the central role of social factors in shaping community sustainability perceptions.

These findings are consistent with those of Lal (2024), Mussa (2021), and Huang Che Wu (2019), who collectively established that economic, environmental, and social impacts of tourism are deeply intertwined with community well-being and sustainability outcomes. The results highlight that sustainable tourism at pilgrimage destinations cannot be achieved by addressing any single dimension in isolation; rather, an integrated, community-centred approach is required.

5. CONCLUSION AND SUGGESTIONS

The present study provides robust empirical evidence that economic, environmental, and social factors significantly influence local community perceptions of tourism sustainability in Tirupati. The findings demonstrate that while pilgrimage tourism generates substantial economic benefits - including income generation, employment creation, and infrastructure development - it simultaneously imposes considerable environmental and social costs that threaten the long-term sustainability of these pilgrimage destinations.

Pilgrimage tourism in Tirupati has proven to be a powerful livelihood mechanism for local communities. The economic reach of tourism is pervasive and transformative. However, the seasonal nature of peak pilgrim flows creates economic instability, while the unequal distribution of tourism revenues perpetuates income disparities within the community.

On the environmental front, plastic waste, water pollution, overcrowding, and inadequate sanitation infrastructure are identified as critical concerns that demand urgent policy intervention

Socially, pilgrimage tourism is perceived as a vehicle for cultural preservation and improved quality of life. However, the commodification of sacred practices, traffic congestion, and the social pressures of mass tourism must be carefully managed to prevent the erosion of community values and identity.

Based on the study's findings, the following suggestions are offered for sustainable tourism management in Tirupati: (i) Development of a comprehensive Sustainable Tourism Policy for Andhra Pradesh's pilgrimage corridors, incorporating environmental carrying capacity assessments; (ii) Establishment of community-based tourism enterprises that ensure equitable distribution of tourism revenues; (iii) Investment in green infrastructure including solar-powered facilities, eco-friendly waste management systems, and organic waste processing plants at Tirumala; (iv) Implementation of digital queue management and crowd dispersal systems to mitigate overcrowding and its associated social and environmental impacts; (v) Creation of a Pilgrimage Tourism Sustainability Fund, jointly managed by the TTD, state government, and local community representatives, to finance sustainable development initiatives.

Future research should focus on longitudinal assessments of tourism sustainability perceptions, incorporating the perspectives of pilgrims, TTD administrators, and state tourism policymakers alongside local community voices. Comparative studies across multiple pilgrimage destinations in Andhra Pradesh and Telangana would further enrich the understanding of sustainable tourism dynamics in sacred landscapes.

REFERENCES

1. J. Pandey, "Medaram Jatara: A Review of the Narratives," *International Journal of Creative Research Thoughts*, vol. 9, no. 6, 2021.
2. N. T. K. Naik and B. S. Lal, "Economic Analysis of Indian Medical Tourism," *International Journal of Business Management Economics and Information Technology*, vol. 5, no. 2, 2013.
3. B. S. Lal, "Sustainable Tourism and Economic Growth in India — An Analysis," *Journal of World Economy*, vol. 3, no. 1, 2024. doi: 10.56397/JWE.2024.03.05.
4. T. A. Hose, "Towards a History of Geotourism: Definitions, Antecedents and the Future," *Geological Society, London*, 2008.
5. Nithya and R. Bahri, "Pilgrimage Tourism in Punjab," *International Journal of Science Technology and Management*, vol. 6, no. 1, 2017.
6. Ministry of Tourism, Government of India, *India Tourism Statistics*. New Delhi: Government of India, 2023.
7. H. C. Wu, "The Impact of the Development of Religious Tourism on Host Community," in *Managing Religious Tourism*, 2019.
8. M. Mohammad, "A Study of Consumer Behaviour for Religious and Pilgrimage Tourism with Special Reference to Amarnath Cave in Kashmir," Doctoral Dissertation, BSB Ambedkar University, 2021.
9. P. S. Gill, *Tourism and Hotel Management*. New Delhi: Anmol Publications Pvt. Ltd., 2002.
10. K. K. Kamra and M. Chand, *Basics of Tourism Theory Operations and Practice*. New Delhi: Kanishka Publishers Distributors, 2004.
11. M. Srivastava, "Assessing International Heritage Tourist Satisfaction in India," *Indian Journal of Marketing*, vol. 39, no. 4, 2009.
12. Tirumala Tirupati Devasthanams (TTD), *Annual Report 2022–23*. Tirupati: TTD Publications, 2023.
13. Coherent Market Insights, *India Faith-Based Tourism Market Report*. 2024. [Coherent Market Insights](https://www.coherentmarketinsights.com/research/report-detail/india-faith-based-tourism-market-report)
14. B. S. Lal, "Green Marketing: Opportunities and Issues," *International Journal of Multidisciplinary Research and Modern Education (IJMRME)*, vol. 1, no. 1, 2015.
15. UNWTO, *Sustainable Tourism Development Guidelines*. Madrid: World Tourism Organization, 2023.