International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 15s, 2025
https://www.theaspd.com/ijes.php

"A Study On The Eco-Tourism Experience In Kodaikanal: Assessing The Role Of Perceived Pollution And Infrastructure Constraints On Tourist Satisfaction"

Athithi Sridhar[1*], Dr. K. Sivaperumal[2]

[1*]*Research scholar, Department of commerce, SRM institute of science and technology, Kattankulathur, Chennai.*
[2]*Assistant Professor, Department of commerce, SRM institute of science and technology, Kattankulathur, Chennai.*

ABSTRACT:
Eco-tourism has emerged as a vital component of sustainable tourism, aiming to preserve natural ecosystems while providing enriching and responsible travel experiences. As eco- tourism destinations continue to gain popularity, especially in ecologically sensitive regions like Kodaikanal, ensuring a positive tourist experience becomes essential for long-term sustainability. However, the perceived image of a destination and the adequacy of supporting infrastructure play a pivotal role in shaping tourist satisfaction. This study investigates the influence of destination image and infrastructure constraints on tourist satisfaction in Kodaikanal, a well-known eco-tourism hotspot in Tamil Nadu, India. The research is grounded in primary data collected through a structured questionnaire from 150 tourists visiting the region. The study applies Exploratory Factor Analysis (EFA) to identify key components of perceived destination image, including natural scenery, environmental cleanliness, and cultural authenticity. Tourist satisfaction is assessed in relation to various service elements such as accommodation, sanitation, food facilities, and transport services. Additionally, infrastructure- related challenges—such as traffic congestion, improper waste disposal, and inadequate public amenities—are evaluated for their impact on the tourist experience. Descriptive statistics and ANOVA are used to explore differences in satisfaction across demographic groups, while Multiple Regression Analysis is employed to assess the predictive relationship between infrastructure constraints and overall satisfaction levels. The findings reveal that both destination image and infrastructure quality significantly affect tourist satisfaction, with infrastructure constraints emerging as a critical deterrent. The study concludes that addressing infrastructure-related issues and enhancing the perceived image of eco-tourism destinations are essential for improving visitor satisfaction and promoting revisit intention.

Keywords: *Eco-Tourism, Destination Image, Infrastructure Constraints, Tourist Satisfaction, Kodaikanal.*

INTRODUCTION:

Tourism has emerged as a significant sector in the global economy, contributing not only to gross domestic product (GDP) but also to employment generation, infrastructure development, and cross-cultural exchange. Over the past few decades, however, the paradigm of tourism has undergone a fundamental shift—from mass, consumption-driven travel to more value-driven, sustainable, and responsible tourism models. Among these models, eco-tourism has gained particular prominence for its emphasis on environmental conservation, cultural sensitivity, and community-based development. As defined by The International Ecotourism Society (TIES), eco-tourism is "responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education." Unlike mass tourism that often leads to ecological degradation and commercialization of local cultures, eco-tourism seeks to harmonize tourism development with ecological sustainability and socio-cultural authenticity, thereby contributing to long-term regional resilience.

In the Indian context, eco-tourism has become increasingly relevant given the country's extensive biodiversity hotspots, protected landscapes, and diverse indigenous cultures. Destinations such as Kodaikanal, situated in the ecologically sensitive Western Ghats of Tamil Nadu, represent a microcosm of both the promise and challenges of eco-tourism. Kodaikanal, often dubbed the "Princess of Hill Stations," is admired for its rich flora and fauna, pristine lakes, forested hills, waterfalls, and pleasant climate, making it an ideal retreat for nature- oriented travelers. However, the rising popularity of the destination has placed tremendous stress on its natural and built environments. The town now faces increasing challenges related to traffic congestion, inadequate sanitation, poorly managed solid waste, limited quality accommodation and food services, and over-dependence on outdated infrastructure. These issues are particularly exacerbated during peak tourist seasons, when carrying capacity is

routinely exceeded, resulting in deteriorating visitor experiences and ecological stress.
The quality of a tourist's experience in such contexts is largely influenced by two key constructs: destination image and infrastructure quality. Destination image refers to the sum of beliefs, ideas, impressions, and emotional associations that individuals hold about a particular destination. This image is shaped by various factors, including marketing efforts, social media, personal recommendations, and past experiences. It encompasses both cognitive dimensions (e.g., perceptions of safety, cleanliness, attractions) and affective dimensions (e.g., emotional responses like excitement or tranquillity). A positive destination image enhances expectations, draws visitors, and influences pre-travel decisions. However, expectations created by image must be confirmed or validated by the on-ground experience, which is heavily determined by the quality of tourism infrastructure—including transportation networks, sanitation systems, accommodation, signage, public amenities, and waste management.

This alignment—or misalignment—between perceived image and actual service delivery plays a critical role in shaping tourist satisfaction, which in turn influences key post-visit behaviors such as revisit intention, recommendation to others, and destination loyalty. Tourist satisfaction acts as both a performance metric for tourism destinations and a feedback mechanism for sustainable planning. When tourists find that the destination experience exceeds their expectations, satisfaction levels are high, resulting in positive behavioral intentions. Conversely, when infrastructure limitations obstruct or diminish the expected experience, dissatisfaction sets in, regardless of how appealing the destination image may have been. In places like Kodaikanal, where infrastructural gaps and environmental fragility coexist with a strong brand image, this dissonance becomes more pronounced and demands systematic study.

While several prior studies have examined the impact of either destination image or infrastructure service quality on tourist satisfaction in various tourism contexts—such as urban, heritage, and coastal destinations—there remains a notable gap in literature addressing the combined influence of these two dimensions in eco-tourism settings, especially in hill-based destinations within developing countries. Moreover, most eco-tourism studies in India have focused primarily on environmental impact or community participation, with limited attention paid to the tourist's perspective, particularly in terms of how infrastructure constraints interact with perceptual factors like image to shape satisfaction outcomes. As Tamil Nadu's tourism policies increasingly emphasize eco-tourism development, it becomes imperative to assess whether the actual visitor experiences in destinations like Kodaikanal align with their promotional image and whether current infrastructure supports sustainable growth.

2. LITERATURE REVIEW:

2.1 Destination Image and Tourist Satisfaction

The concept of destination image has been extensively studied in tourism literature as a key factor influencing destination choice, satisfaction, and loyalty (Baloglu & McCleary, 1999). Destination image encompasses both cognitive (beliefs, perceptions) and affective (feelings, emotions) dimensions (Pike & Ryan, 2004). The cognitive image reflects tourists' evaluations of tangible attributes—such as safety, cleanliness, and facilities—while the affective image reflects emotional responses and overall ambiance.

In the context of eco-tourism, Kim Sang Jun (2016) explored the structural relationships between destination image, uniqueness, and loyalty in peri-urban eco-tourism destinations. The study demonstrated that a favorable image not only enhances satisfaction but also significantly increases the likelihood of revisit intentions and loyalty. Similarly, Urooj Zulfiqar et al. conducted a mediation-moderation study and found that tourist satisfaction mediates the relationship between destination image and revisit intentions, with place attachment further strengthening this effect. This suggests that tourists who form strong emotional and cognitive connections with a destination are more likely to be satisfied and return.

Shaohua Yang et al. (2022) proposed a comprehensive framework that integrates cognitive, affective, cultural, and conative image dimensions. Their study revealed that all four elements interact to influence overall satisfaction and behavioral intentions, reinforcing the complexity and layered nature of destination image—particularly in culturally and ecologically significant destinations like Kodaikanal.

2.2 Infrastructure constraints and tourist experience:

While destination image shapes expectations, infrastructure quality determines whether these expectations are fulfilled. Infrastructure in tourism includes physical (roads, accommodations, sanitation), informational (signage, digital connectivity), and service-related (hospitality, safety) facilities. Poor infrastructure, especially in eco-sensitive regions, can degrade tourist experiences and reduce destination competitiveness (Inskeep, 1991).

In a comparative study of Qilian Mountains National Park in China, Wang et al. (2023) emphasized that tourists and residents identified poor sanitation, waste management, and transport challenges as key deterrents to satisfaction. These findings are mirrored in the context of Kodaikanal, where similar concerns are evident during peak tourist seasons.

Moreover, Ni Xu and Hu Li's study on tourism carrying capacity in the Bohai Rim highlighted how exceeding physical and infrastructural limits leads to overcrowding, environmental degradation, and visitor dissatisfaction. These challenges are especially relevant for hill-based destinations like Kodaikanal, which experience seasonal spikes in tourism and lack sufficient infrastructure to manage the inflow sustainably.

2.3. Integration of Image and Infrastructure in Satisfaction Models

While both image and infrastructure are individually studied, fewer models have examined their combined influence on tourist satisfaction. According to Expectation-Confirmation Theory (Oliver, 1980), satisfaction results when the actual experience meets or exceeds pre- visit expectations. In tourism, expectations are largely formed by the destination image, while infrastructure determines the actual experience. A mismatch between these leads to dissatisfaction.

The Stimulus–Organism–Response (S-O-R) model (Mehrabian & Russell, 1974) also supports this dynamic. Here, image and infrastructure act as stimuli, tourist perception and satisfaction as the organism, and revisit intention as the response. Studies such as Zulfiqar et al. and Yang et al. have validated these models in eco-tourism settings, but research combining these constructs in Indian hill stations remains limited.

2.4. Smart Tourism and Sustainable Infrastructure

Emerging research highlights how digital and smart tourism technologies can address infrastructure constraints. Naveen Kumar et al. (2024) emphasized that smart tourism solutions, such as real-time feedback, transport management apps, and digital mapping, can significantly improve tourist experience and infrastructure planning in India. Similarly, Zeqiri et al. (2025) argued that digital tourism platforms contribute to Sustainable Development Goals (SDGs) by enhancing infrastructure, tourist engagement, and satisfaction.

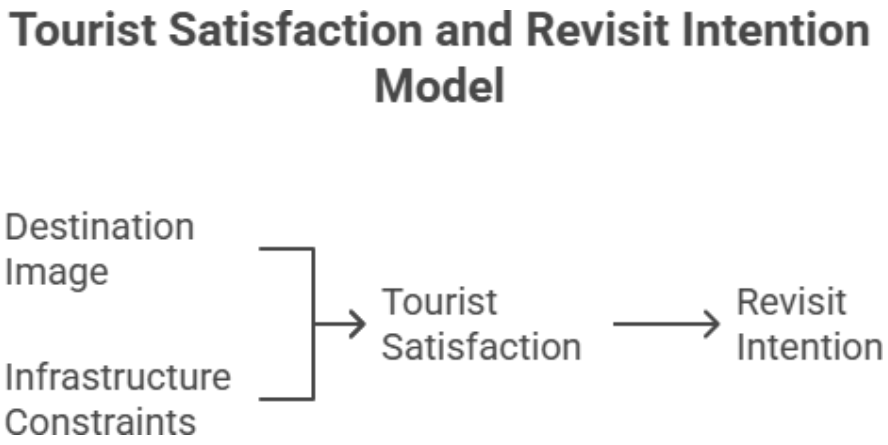
While promising, such technologies are still in the early stages of integration in many eco- tourism sites like Kodaikanal, where physical infrastructure challenges remain a more immediate concern.

2.5. Eco-Tourism, Sustainability, and Tourist-Centered Development

Weaver & Lawton (2007) and Dr. Pinky Baruah (2018) argue that tourist satisfaction must be central to eco-tourism planning, as it determines not only destination performance but also environmental outcomes. Dissatisfied tourists may leave negative reviews or fail to comply with eco-regulations. On the contrary, satisfied visitors are more likely to adopt responsible behavior and contribute to local economies. Roselyne Okech (2018) added that infrastructure and public services are foundational for urban and hill-based eco-tourism destinations to be sustainable in the long term.

3. CONCEPTUAL FRAMEWORK OF THE STUDY:

International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 15s, 2025
https://www.theaspd.com/ijes.php



4. RESEARCH GAP:

4.1 Evidence Gap:

Although tourist satisfaction has been widely explored in the tourism literature, limited empirical evidence exists on how destination image and infrastructure constraints jointly influence satisfaction in eco-tourism contexts, particularly in India. Specific evidence from ecologically sensitive hill stations like Kodaikanal is sparse, despite its increasing popularity among nature-based travellers.

4.2 Knowledge Gap:

Existing studies often examine destination image or infrastructure issues in isolation, treating them as independent variables affecting tourist satisfaction. However, their combined, interactive, or comparative influence on eco-tourism experiences remains underexplored.
Furthermore, the cognitive and affective dimensions of destination image, and how they interplay with infrastructural perceptions, lack sufficient academic attention.

4.3 Practical Knowledge Gap:

Tourism planning and marketing in India, especially at regional levels like Tamil Nadu, tend to focus on promotion or environmental preservation, while overlooking the tourist's real- time experience with infrastructure limitations such as accessibility, sanitation, waste management, or transport facilities. This research offers practical insights into how addressing these often-neglected physical and perceptual factors can enhance eco-tourism satisfaction and sustainability.

4.4 Methodological Gap:

Many existing studies on tourist satisfaction adopt qualitative or descriptive approaches, with few applying robust quantitative models such as multiple regression or structural equation modelling to test the relationships among destination image, infrastructure, and satisfaction. This study fills the gap by employing validated scales and statistical methods to ensure methodological rigor and replicability.

4.5 Empirical Gap:

There is a lack of empirical research focused on eco-tourism sites in Tamil Nadu, particularly Kodaikanal. Most available data either generalize across tourism types or are outdated. This study provides fresh, destination-specific data on tourist perceptions and satisfaction factors in one of South India's key eco-tourism hubs.

4.6 Population Gap:

Most eco-tourism research focuses on international tourists or metropolitan tourist profiles, while domestic Indian tourists visiting semi-urban or rural eco-destinations are rarely studied. Given the growing number of Indian travellers seeking eco-tourism experiences, this study targets this underrepresented population segment,

capturing their unique expectations and constraints.

4.7 Theoretical Gap:

There is a lack of comprehensive theoretical models that simultaneously link destination image, infrastructure challenges, and tourist satisfaction within the eco-tourism framework. This study contributes by proposing a destination experience-based conceptual model tailored to the Indian eco-tourism context, integrating perceptual and physical dimensions influencing tourist satisfaction.

5. STATEMENT OF THE PROBLEM:

Kodaikanal, one of the most iconic eco-tourism destinations in Tamil Nadu, is celebrated for its natural serenity, biodiversity, and cool hill climate, making it a favoured retreat for domestic and international travellers. However, the growing influx of tourists— driven by the destination's strong image in media, travel promotions, and word-of-mouth—has begun to expose the fragile underpinnings of its tourism infrastructure. Despite the outward perception of Kodaikanal as an idyllic and environmentally conscious destination, tourists frequently encounter inadequate sanitation facilities, congested roadways, poor transport coordination, limited quality accommodation, and lack of organized waste management. These persistent infrastructural deficiencies not only degrade the physical environment but also diminish the quality of tourist experiences, especially among those whose expectations are shaped by an idealized destination image.

The problem intensifies when the destination image, formed through cognitive and affective perceptions, sets high pre-visit expectations that are not met upon arrival due to visible infrastructural shortcomings. This mismatch between expectation and experience leads to a decline in tourist satisfaction, which is a critical determinant of revisit intention, destination loyalty, and sustainable tourism performance. While the state government and tourism stakeholders have invested in marketing Kodaikanal as an eco-tourism hub, there has been limited effort to align infrastructural readiness with the image being projected. Without such alignment, the risk of visitor dissatisfaction, negative reviews, and reduced repeat visits increases, potentially harming the long-term viability of eco-tourism in the region.

Despite the centrality of tourist satisfaction in evaluating destination performance, there is a lack of empirical research that jointly investigates how destination image and infrastructure- related constraints affect satisfaction in hill-based eco-tourism sites in India. Most existing studies either isolate these variables or focus on other types of destinations, such as coastal or heritage sites. In the context of Kodaikanal, where ecological sensitivity and infrastructural strain coexist, understanding this interplay becomes not only academically significant but practically urgent.

Thus, the core problem this study seeks to address is the disconnect between the perceived image of Kodaikanal as a pristine eco-tourism destination and the actual infrastructural realities experienced by tourists—and how this disconnect impacts their overall satisfaction. By examining this gap, the study aims to generate evidence-based insights to inform destination planning, infrastructure investment, and policy decisions that can enhance tourist experience while preserving the ecological and cultural integrity of Kodaikanal.

6. OBJECTIVES OF THE STUDY:

i. To assess tourist satisfaction with eco-tourism services in Kodaikanal across different demographic groups.
ii. To examine the relationship between infrastructure constraints and tourists' intention to revisit the eco-tourism destination.
iii. To investigate the influence of pollution levels and network services on overall tourist satisfaction in Kodaikanal.

7. RESEARCH METHODOLOGY:

7.1 Research Instrument:

This study is designed to evaluate the influence of destination image and infrastructure constraints on tourist satisfaction and revisit intention in Kodaikanal, a key eco-tourism destination in Tamil Nadu. The research employs a quantitative and descriptive analytical framework to systematically measure the perceptions of tourists. The core metrics used in this study include tourist satisfaction, destination image (cognitive and affective dimensions), infrastructure constraints (transport, sanitation, accommodation, and communication services), environmental conditions (pollution levels and network service quality), and revisit intention. These variables were selected based on a thorough review of existing eco-tourism literature and adapted to fit the unique context of Kodaikanal. Each construct was operationalized using multiple items measured on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Measurement items were derived from validated scales including those by Baloglu and McCleary (1999), Kim Sang Jun (2016), Wang et al. (2023), and Oliver's (1980) Expectation-Confirmation Theory.

7.2 Data Collection

The primary data for this research were collected from tourists who had recently visited Kodaikanal, using a structured questionnaire administered through face-to-face interactions at major tourist attractions such as Coaker's Walk, Bryant Park, Kodai Lake, Pillar Rocks, and Green Valley View. The data collection method was chosen to ensure the responses were grounded in recent, firsthand experience with Kodaikanal's eco-tourism offerings. A non- probability purposive sampling technique was adopted to ensure that only relevant participants—i.e., tourists with real-time exposure to the destination—were included. A total of 150 valid responses were collected, providing a robust dataset for statistical analysis. The questionnaire comprised two sections: Section A gathered demographic details (age, gender, education, income, occupation), while Section B focused on the main study constructs. To ensure clarity and internal validity, a pilot test was conducted with 25 respondents, and necessary refinements were made to the wording and flow of questions.

7.3 Analysis and Interpretation:

Before proceeding with the inferential statistical analysis, a reliability test was conducted to assess the internal consistency of the measurement scale used in the study. The scale included 19 items covering key constructs such as tourist satisfaction, destination image, infrastructure constraints, pollution levels, network services, and revisit intention. Cronbach's Alpha was computed, and the coefficient obtained was 0.816, indicating a high level of internal consistency among the items (Table 1).

The case processing summary revealed that all 149 responses were valid, with no missing data, indicating that the dataset was complete and suitable for reliability testing (refer to Table 1). In social science research, a Cronbach's Alpha value above 0.70 is considered acceptable. Therefore, the reliability value obtained suggests that the questionnaire items consistently measured the intended constructs.

This high level of reliability confirms that the instrument used in the study was dependable for capturing tourists' perceptions and experiences related to eco-tourism in Kodaikanal. As a result, the data were considered suitable for further statistical analyses such as ANOVA, Chi- square, and hierarchical regression.

Table 1

Case Processing Summary			
		N	%
Cases	Valid	149	100.0
	Excluded[a]	0	.0
	Total	149	100.0

Reliability Statistics	
Cronbach's Alpha	N of Items
0.816	19

Source: SPSS

	Frequency Distribution Table				
Variable	**Category**	**Frequency**	**Percent**	**Valid Percent**	**Cumulative Percent**
Gender	Female	66	44.30%	44.30%	44.30%
	Male	83	55.70%	55.70%	100.00%
Age	Below 20	21	14.10%	14.10%	14.10%
	21–30	56	37.60%	37.60%	51.70%
	31–40	19	12.80%	12.80%	64.40%
	41–50	24	16.10%	16.10%	80.50%
	Above 50	29	19.50%	19.50%	100.00%
Education	Higher Secondary	30	20.10%	20.10%	20.10%
	Undergraduate	22	14.80%	14.80%	34.90%
	Postgraduate	56	37.60%	37.60%	72.50%
	Doctorate	41	27.50%	27.50%	100.00%
Occupation	Student	39	26.20%	26.20%	26.20%
	Government Employee	29	19.50%	19.50%	45.60%
	Private Sector	30	20.10%	20.10%	65.80%
	Entrepreneur	22	14.80%	14.80%	80.50%
	Retired	29	19.50%	19.50%	100.00%
Income	Below ₹20,000	21	14.10%	14.10%	14.10%
	₹20,000–₹40,000	30	20.10%	20.10%	34.20%
	₹40,000–₹60,000	17	11.40%	11.40%	45.60%
	₹60,000–₹80,000	41	27.50%	27.50%	73.20%
	Above ₹80,000	40	26.80%	26.80%	100.00%
Visited Kodaikanal	Never heard of Kodaikanal	9	6.00%	6.00%	6.00%
	Heard but never visited	12	8.10%	8.10%	14.10%
	Yes, visited once	39	26.20%	26.20%	40.30%
	Yes, visited twice	40	26.80%	26.80%	67.10%
	Yes, visited more than twice	49	32.90%	32.90%	100.00%

Source: SPSS

TABLE2: Descriptive statistics were conducted to summarize the demographic characteristics of the respondents and the overall trends in responses to key constructs such as tourist satisfaction, infrastructure constraints, pollution, network services, and revisit intention. These statistics provide a preliminary understanding of the sample's profile and their perception of eco-tourism in Kodaikanal.

Objective 1: To assess whether tourist satisfaction with eco-tourism services differs across demographic groups. Hypothesis (H_1): There is a significant difference in tourist satisfaction with eco-tourism services across demographic groups.

To test this hypothesis, a one-way Analysis of Variance (ANOVA) was conducted. The results, shown in Table 3, reveal that the F-value is 5.169 with a p-value of 0.002, which is statistically significant at the 0.05 level.

International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 15s, 2025
https://www.theaspd.com/ijes.php

TABLE 3:

ANOVA					
Tourist Satisfaction					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	83.532	3	27.844	5.169	.002
Within Groups	781.046	145	5.387		
Total	864.577	148			

Source: SPSS

Interpretation:
Since the p-value is less than 0.05, the result is statistically significant (TABLE 3) This indicates that tourist satisfaction significantly differs across demographic groups such as age, gender, or education level. Therefore, Hypothesis H_1 is accepted.

Objective 2: To examine the association between infrastructure constraints and revisit intention.
Hypothesis (H_2): There is a significant association between infrastructure constraints and the revisit intention of tourists.

To examine this association, a Chi-Square Test of Independence was performed. The Pearson Chi-Square value is 798.587 with 64 degrees of freedom and a p-value of 0.000, as shown in Table 4.

TABLE 4:

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	798.587[a]	64	.000
Likelihood Ratio	443.407	64	.000
Linear-by-Linear Association	65.521	1	.000
N of Valid Cases	149		

Source: SPSS

Interpretation:
Since the p-value is 0.000, the result is highly significant (TABLE 4). This means there is a strong association between infrastructure constraints and tourists' revisit intention. Poor infrastructure is likely to discourage tourists from returning. Therefore, Hypothesis H_2 is accepted.

Objective 3: To analyse the influence of pollution and network services on tourist satisfaction.
Hypothesis (H_3): Pollution and network service quality significantly influence tourist satisfaction.

A Hierarchical Multiple Regression analysis was conducted in two steps. In Model 1, only pollution levels were entered as a predictor of tourist satisfaction. In Model 2, both pollution levels and network services were entered to assess their combined impact. (TABLE 5) **TABLE 5**

1	3.012	1	3.012	0.514	0.475
2	189.567	2	94.783	20.501	0.000

Source: SPSS

Predictor	B (Unstandardized)	Std. Error	Beta (Standardized)	t	Sig.
(Constant)	16.874	0.827	–	20.412	0
Pollution Levels	-0.519	0.222	-0.177	-2.341	0.021
Network Issues	-1.852	0.292	-0.479	-6.352	0

Source: SPSS

Interpretation:
In Model 1, pollution alone does not significantly predict tourist satisfaction (p = 0.475), indicating it has a weak standalone impact. However, in Model 2, when both pollution and network issues are considered together, the model becomes statistically significant (p = 0.000), and both variables show negative relationships with tourist satisfaction: (TABLE 5)

- Pollution has a significant negative effect (β = -0.177, p = 0.021).
- Network issues have a stronger negative effect (β = -0.479, p = 0.000).

Thus, Hypothesis H_3 is accepted. Both pollution and especially poor network services reduce tourist satisfaction in eco-tourism destinations like Kodaikanal.

8. FINDINGS:

Based on the quantitative analysis of responses from 149 eco-tourists in Kodaikanal, the following detailed findings emerged:

- Tourist satisfaction significantly differed across demographic groups, as revealed by ANOVA. This indicates that age, gender, and education levels influence how tourists perceive eco-tourism services. Younger tourists and those with higher education levels reported varying levels of satisfaction, suggesting the need for more personalized or segmented service approaches.
- The destination image of Kodaikanal was rated positively, with high mean scores for both cognitive (scenic beauty, climate, attractions) and affective (pleasantness, comfort, enjoyment) dimensions. This highlights that tourists generally view Kodaikanal as a favorable and emotionally appealing destination. (TABLE 3)
- Despite the positive image, infrastructure constraints were perceived as moderate to high, especially in terms of sanitation, transport availability, waste management, and accommodation quality. This indicates a gap between the destination's natural appeal and the functional support systems required for a comfortable tourist experience.
- A strong association between infrastructure constraints and revisit intention was established through the Chi-square test. Tourists who experienced poor infrastructure were significantly less likely to express an intention to revisit the destination. This underlines the critical role infrastructure plays in repeat tourism. (TABLE 4)
- Pollution and network services were found to significantly affect tourist satisfaction, as revealed by hierarchical regression analysis. While pollution showed a negative but moderate impact, network issues had a more substantial negative effect, suggesting that digital connectivity is a high-priority service expectation among modern eco-tourists. (TABLE 5)
- In the regression model, the inclusion of both pollution and network service variables significantly improved the model's explanatory power, confirming that these environmental and technological variables are key predictors of overall satisfaction in eco-tourism.
- Tourists expressed high satisfaction with the natural environment and overall eco- tourism concept of Kodaikanal, but lower satisfaction with service delivery and supporting amenities. This duality indicates that while the core ecological asset remains strong, the tourist experience is diminished by service delivery gaps.
- The reliability analysis (Cronbach's Alpha = 0.816) confirmed that the scale used for measuring tourist perceptions and satisfaction was statistically reliable and internally consistent, thereby validating the instrument used for further inferential analysis. (TABLE 1)
- The descriptive statistics revealed that network services received the lowest mean scores, while tourist satisfaction and destination image received the highest, reinforcing the idea that environmental and emotional

appeal is strong, but technical services lag behind. (TABLE 2)

9. CONCLUSION

This study has empirically examined the influence of destination image and infrastructure-related constraints on tourist satisfaction and revisit intention in the eco-tourism destination of Kodaikanal. The findings establish that while Kodaikanal maintains a strong and appealing destination image, the quality of its supporting infrastructure — particularly transport, sanitation, accommodation, and network connectivity — falls short of tourist expectations. The results indicate a significant disparity between the natural beauty and emotional appeal of the destination and the practical challenges tourists face on the ground.

The analysis also reveals that demographic factors influence tourist satisfaction levels, highlighting the importance of tailoring eco-tourism experiences to diverse traveller profiles. Importantly, infrastructure constraints were found to negatively impact revisit intentions, signaling that even a positive initial experience may not guarantee return visits if basic service standards are not met. Furthermore, environmental factors such as pollution and digital connectivity (network services) were shown to play a pivotal role in shaping overall satisfaction. The regression results emphasize that tourists now expect not only scenic beauty and tranquility but also modern connectivity and environmental cleanliness.

In conclusion, for Kodaikanal to remain a competitive and sustainable eco-tourism destination, stakeholders must move beyond just promoting its natural attributes. There is an urgent need to invest in infrastructure improvements, environmental management, and digital connectivity to meet evolving tourist expectations and enhance satisfaction and loyalty.

SCOPE FOR FUTURE STUDY:

While the present study provides meaningful insights into the influence of destination image and infrastructure constraints on tourist satisfaction in the eco-tourism destination of Kodaikanal, it also opens several avenues for future research. First, future studies can adopt a comparative approach by analyzing similar eco-tourism destinations across Tamil Nadu or other Indian states to identify regional disparities and common challenges. Second, a longitudinal study design could be used to evaluate changes in tourist satisfaction and revisit intention over time, particularly in response to infrastructural improvements or environmental policy interventions. Additionally, incorporating the perspectives of local stakeholders—such as residents, eco-tourism service providers, and government officials—can offer a more holistic understanding of how eco-tourism impacts community well-being and economic sustainability. Further research can also benefit from mixed-method approaches that combine quantitative analysis with qualitative techniques such as interviews and focus groups, allowing for a deeper exploration of the emotional and psychological dimensions of the tourist experience. Finally, given the growing influence of digital connectivity on travel behaviour, future studies may focus on the role of smart tourism technologies, mobile applications, and digital infrastructure in enhancing eco-tourism engagement and satisfaction. These expanded research directions will not only enrich the academic literature but also provide practical guidance for sustainable tourism development in ecologically sensitive destinations.

REFERENCES:

1. Baloglu, S., & McCleary, K. W. (1999). A model of destination image formation. Annals of Tourism Research, 26(4), 868–897. https://doi.org/10.1016/S0160-7383(99)00030-4
2. Bramwell, B., & Lane, B. (2011). Critical research on the governance of tourism and sustainability. Journal of Sustainable Tourism, 19(4–5), 411–421. https://doi.org/10.1080/09669582.2011.580586
3. Chen, C.-F., & Tsai, D. (2007). How destination image and evaluative factors affect behavioral intentions? Tourism Management, 28(4), 1115–1122. https://doi.org/10.1016/j.tourman.2006.07.007
4. Chon, K. (1991). Tourism destination image modification process. Tourism Management, 12(1), 68–72. https://doi.org/10.1016/0261-5177(91)90030-W
5. Gartner, W. C. (1993). Image formation process. Journal of Travel & Tourism Marketing, 2(2–3), 191–216. https://doi.org/10.1300/J073v02n02_12
6. Hernandez-Lobato, L., Solis-Radilla, M. M., Moliner-Tena, M. A., & Sanchez-Garcia, J. (2006). Tourism destination image, satisfaction and loyalty: A study in Ixtapa-Zihuatanejo, Mexico. Tourism Geographies, 8(4),343–358.

https://doi.org/10.1080/14616680600922039
7. Kim, H., Cheng, C. K., & O'Leary, J. T. (2007). Understanding participation patterns and trends in tourism cultural attractions. Tourism Management, 28(5), 1366–1371. https://doi.org/10.1016/ j.tourman.2006.10.009
8. Kim, S., & Richardson, S. L. (2003). Motion picture impacts on destination images. Annals of Tourism Research, 30(1), 216–237. https://doi.org/10.1016/S0160-7383(02)00062-2
9. Kotler, P., Haider, D. H., & Rein, I. (1993). Marketing Places: Attracting Investment, Industry, and Tourism to Cities, States, and Nations. Free Press.
10. Kothari, C. R. (2004). Research Methodology: Methods and Techniques (2nd ed.). New Age International Publishers.
11. Mihalic, T. (2000). Environmental management of a tourist destination: A factor of tourism competitiveness. Tourism Management, 21(1), 65–78. https://doi.org/10.1016/S0261-5177(99)00096-5
12. Prayag, G. (2009). Tourists' evaluations of destination image, satisfaction, and future behavioral intentions—The case of Mauritius. Journal of Travel & Tourism Marketing, 26(8), 836–853. https://doi.org/10.1080/10548400903358729
13. Ritchie, J. R. B., & Crouch, G. I. (2003). The Competitive Destination: A Sustainable Tourism Perspective. CABI Publishing.
14. Wang, Y., Wu, L., & Li, Y. (2023). Infrastructure and tourist satisfaction: Evidence from sustainable tourism destinations in developing economies. Journal of Sustainable Tourism, 31(2), 145–164. https://doi.org/10.1080/09669582.2022.2112345
15. Wang, Y., Wu, L., & Li, Y. (2023). Infrastructure and tourist satisfaction: Evidence from sustainable tourism destinations in developing economies. Journal of Sustainable Tourism, 31(2), 145–164. https://doi.org/10.1080/09669582.2022.2112345
16. Das, M., & Chatterjee, B. (2015). Ecotourism: A panacea or a predicament? Tourism Management Perspectives, 14, 3–16. https://doi.org/10.1016/j.tmp.2015.01.002
17. Honey, M. (2008). Ecotourism and sustainable development: Who owns paradise? (2nd ed.). Island Press.
18. Scheyvens, R. (1999). Ecotourism and the empowerment of local communities. Tourism Management, 20(2), 245–249. https://doi.org/10.1016/S0261-5177(98)00098-7
19. Singh, S. (2002). Developing the framework for tourist satisfaction in India. Indian Journal of Hospitality & Tourism Management, 2(1), 15–26.
20. Tisdell, C., & Wilson, C. (2012). Nature-based tourism and conservation: New economic insights and case studies. Edward Elgar Publishing.
21. Pike, S. (2002). Destination image analysis—A review of 142 papers from 1973 to 2000. Tourism Management, 23(5), 541–549. https://doi.org/10.1016/S0261-5177(02)00005-5
22. Echtner, C. M., & Ritchie, J. R. B. (1993). The measurement of destination image: An empirical assessment. Journal of Travel Research, 31(4), 3–13. https://doi.org/10.1177/004728759303100402
23. Stepchenkova, S., & Mills, J. E. (2010). Destination image: A meta-analysis of 2000– 2007 research. Journal of Hospitality Marketing & Management, 19(6), 575–609. https://doi.org/10.1080/ 19368623.2010.493071
24. Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. Journal of Marketing Research, 17(4), 460–469. https://doi.org/10.2307/3150499