

Ecotourism In Tribal Lands: An Analysis Of Socio-Economic Gains And Environmental Trade-Offs

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Abstract:

"Travel to enjoy the world's amazing diversity of natural life and human culture without causing damage to either-Ecotourism. --Tickell (1994)"

Ecotourism has become a significant approach to sustainable development in tribal areas, contributing both opportunities and challenges for indigenous groups and communities. This study explores tribal communities' reaction towards the socio-economic benefits and environmental impacts of ecotourism, with a focus on tribes in the Nilgiris District of Tamil Nadu. Data was collected through surveys with 50 ecotourism tribal respondents. Overall, results indicated an improvement in standard of living, as well as diversification of income as key benefits to ecotourism. On the other hand, the differences in training opportunities distributed to males versus their female counterparts ($\chi^2 = 4.154$, $*p = 0.042$) indicated inequity in benefit opportunities perceived by male and female respondents. Further, environmental impacts such as waste accumulation resulting in unsightliness, and disruption to the social context of indigenous communities was still reported. The study indicated the importance of equitable policies beyond "indigenous" tourism, waste management, and community-based tourism for equitable and sustainable ecotourism development in tribal regions.

Keywords: Ecotourism, Tribal perspectives, Cultural and environmental impacts

Date of Submission: 24-07-2026

Date of Acceptance: 04-08-2026

I. Introduction

Ecotourism is being increasingly advocated as an ecologically sustainable practice for managing the conflict between conservation and economic development in tribal areas. The Nilgiris District in Tamil Nadu is home to 6 Particularly Vulnerable Tribal Groups namely Todas, Kotas, Irulas, Paniyas, Kattunayakans and Kurumbas and is one example of a district where there is an increase in ecotourism projects. While the ecotourism projects offer livelihood opportunities to the tribal communities, the impacts on the indigenous communities are not just related to incomes; there may be changes in social relationships, cultural practices of the tribal groups, and access to the environment.

This paper finds how the tribal communities consider the changes associated with ecotourism, both positively (economic) and negatively (cultural and access).

II. Objectives

1. To analyse tribal perceptions of the socio-economic benefits derived from ecotourism.
2. To assess the perceived challenges or costs associated with ecotourism, including cultural and environmental impacts.

III. Review Of Literature

Pujar & Mishra (2024), while conducting research on ecotourism and indigenous livelihoods in Western Odisha, discovered that although tribal groups recognized ecotourism as a source of revenue, the yield was not evenly shared. Their research indicated that training and employment were more readily accessible to men, while women and less educated groups were usually denied access. The research also emphasized the requirement for more inclusive tourism models that incorporate traditional knowledge and cultural practices, and suggested community-led management to ensure long-term sustainability.

Das & Chatterjee (2015) on tribal ecotourism in India indicates that communities perceive improved income and livelihood diversification as key benefits. Their study in Sundarbans found that ecotourism helped reduce dependence on forest resources, providing more stable earnings.

Lapeyre (2011) highlights that ecotourism has the potential to improve women's economic engagement through handicrafts and homestays. However, structural barriers—such as lack of training and patriarchal norms—often impede women's participation, perpetuating the gender gap seen in this study.

IV. Methodology

Area of study:

This study was carried out within the Nilgiris District of Tamil Nadu and required assembling data from tribal individuals who have engaged in ecotourism employment. In contrast to sampling from villages, this study sampled respondents from particular ecotourism destinations within the district, primarily Ooty, Coonoor and Kotagiri taluks

The locations from where the respondents were drawn include:

- Pykara Waterfalls and Shooting Spot (9th Mile) in Ooty Taluk
- Dolphin's Nose and Lamb's Rock in Coonoor Taluk
- Kodanad View Point and Catherine Falls in Kotagiri Taluk

These sites are major ecotourism attractions that actively engage local tribal communities in activities such as nature guiding, souvenir sales, food vending, transport assistance, and maintenance. Kundah Taluk was also part of the district profile but had no eligible respondents involved in ecotourism during the time of the study.

This area-based respondent selection allowed for a focused understanding of ecotourism's livelihood effects on tribal individuals actively participating in the tourism economy across different sub-regions of the Nilgiris.

Map 1 Nilgiris District Map



Source: TTDC Nilgiris

Period of Study:

As primary data collection was employed for this study it was conducted within a week from July 6, 2025 to July 13, 2025. Structured interviews with tribal respondents were run in several important ecotourism sites in the Nilgiris District.

Sampling:

The final sample comprised 50 tribal respondents (Todas, Kotas, Kurumbas) selected using a purposive sampling technique, whereby all of the respondents had direct experience, and lived experience in ecotourism activities. The researcher employed a non-probability sampling technique. Here non-probability sampling (Purposive Sampling) was employed in order to collect meaningful experiential data from respondents who are engaged with ecotourism related livelihoods.

Tools used:

Data collection employed a well-organized interview schedule with both closed-ended and Likert-scale questions. The instrument was aimed at capturing important themes including:

- Income and job opportunities changes
- Improvements in standards of living
- Ecotourism's cultural and environmental effects
- Training and benefit-sharing access

Statistical Tools:

The data gathered were analyzed through descriptive statistics (percentages, frequencies) and mean analysis of the Likert scale to determine perceptions of socio-economic advantages and disadvantages. A Chi-Square test of independence was also used to identify whether gender is associated with ecotourism training access. SPSS 26 was used for the analysis.

Hypotheses Tested:

To explore gender-based differences in training access, the following hypotheses were formulated and tested:

Null Hypothesis (H_0):

There is no significant association between gender and access to ecotourism training among tribal respondents.

Alternative Hypothesis (H_1):

There is a significant association between gender and access to ecotourism training among tribal respondents.

V. Analysis And Findings:

Objective: 1

Table 1 Distribution of Respondents by Gender

<i>Gender</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Male</i>	23	46
<i>Female</i>	27	54
<i>Total</i>	50	100

Source: Field Survey 2025

Table 2 Distribution of Respondents by Age

<i>Age</i>	<i>Frequency</i>	<i>Percent</i>
<i>20-30</i>	19	38
<i>31-40</i>	18	36
<i>41-50</i>	11	22
<i>51-60</i>	2	4
<i>Total</i>	50	100

Source: Field Survey 2025

The above tables 1 and 2 present the demographic profile of the tribal respondents, categorised by gender and age. As shown in Table 1, the sample consists of 27 female respondents (54%) and 23 male respondents (46%). Table 2 constitutes the age distribution of respondents. A significant proportion (74%) of the respondents fall within the 20–40 age group, with 38% aged 20–30 and 36% aged 31–40.

Table 3 Chi-square table between Gender and ecotourism-related training

<i>Test</i>	<i>Value</i>	<i>df</i>	<i>Asymptotic Sig. (2-sided)</i>	<i>Exact Sig. (2-sided)</i>	<i>Exact Sig. (1-sided)</i>
<i>Pearson Chi-Square</i>	4.154	1	0.042	—	—
<i>Continuity Correction (Yates)</i>	3.075	1	0.080	—	—
<i>Likelihood Ratio</i>	4.229	1	0.040	—	—
<i>Fisher's Exact Test</i>	—	—	—	0.052	0.039
<i>Linear-by-Linear Association</i>	4.071	1	0.044	—	—

Source: Field Survey 2025

Table 3 illustrates Chi-Square test conducted to examine the interaction between gender and access to training related to ecotourism among tribal respondents. The findings established statistically significant relationship between the two variables, $\chi^2(1, N = 50) = 4.154$, $p = 0.042$, which meant that male and female respondents were not equally accessing training opportunities. On a closer examination of the data revealed that a greater percentage of male respondents indicated having undergone tourism training, with female respondents being underrepresented in this regard. Such a gender imbalance in access to skill development programs could have implications for how benefits of ecotourism are shared, especially in terms of income prospects and empowerment.

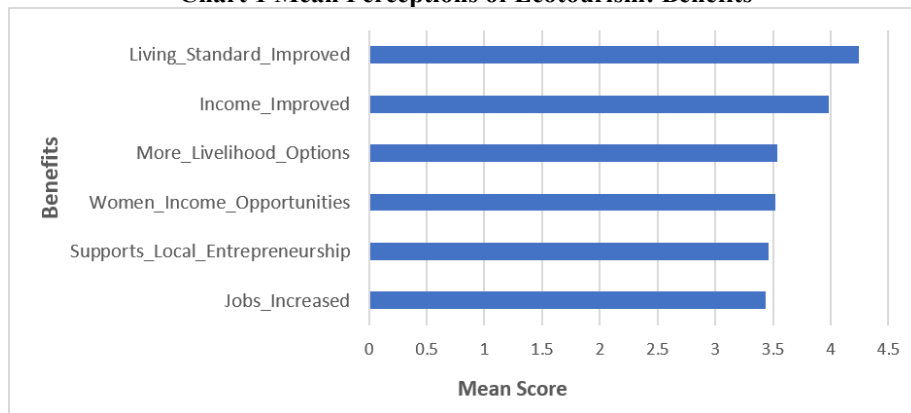
Thus, Null Hypothesis (H_0) was rejected and Alternative Hypothesis (H_1) was accepted, there is a significant association between gender and access to ecotourism training among tribal respondents.

The association was also confirmed by the Likelihood Ratio test ($p = 0.040$) and the Linear-by-Linear Association ($p = 0.044$), whereas the one-sided Fisher's Exact Test also got close to significance ($p = 0.039$).

These results indicate a need for wider and more specific training programs so that tribal women can be allowed to participate in and benefit from ecotourism activities fully.

Objective 2:

Chart 1 Mean Perceptions of Ecotourism: Benefits



Source: Field Survey 2025

Chart 1 displays the mean scores for variables representing tribal respondents' perceptions of the positive socio-economic outcomes of ecotourism. All the above items were rated on a 5-point Likert scale.

From the above chart we can interpret that the highest mean score was found for the statement "*Has your Living standard improved*", suggesting that a substantial proportion of ecotourism workers perceive a direct improvement in their overall quality of life as a result of ecotourism activities. This concurs with the general literature that connects sustainable tourism schemes with improved well-being among rural communities.

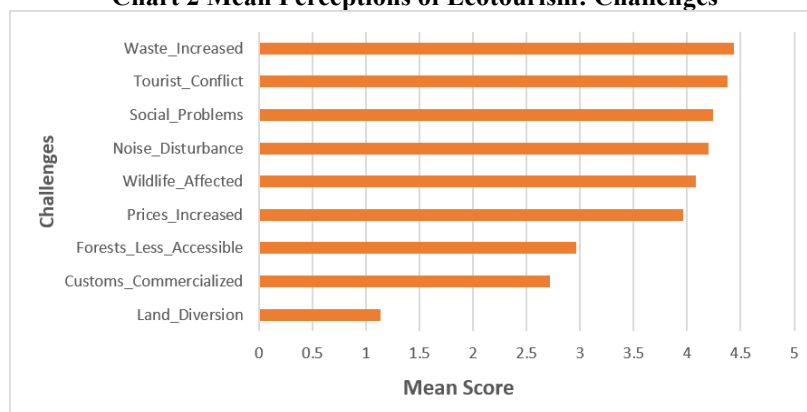
Closely adhering to this, the measures "*Has Income improved due to Ecotourism*" and "*Got More livelihood options*" also had high average scores, reflecting that ecotourism is viewed as an effective channel for income generation and employment diversification. This reinforces the notion that ecotourism contributes meaningfully to local economic resilience by offering alternatives to traditional income sources such as agriculture or wage labour.

The items "*Does Women have better income opportunities*", "*Does Ecotourism supports local entrepreneurship*", and "*Has Ecotourism increased jobs in our area*" were rated slightly lower but still reflect favourable perceptions, with mean scores above the neutral midpoint of the Likert scale. These results highlight that while ecotourism is contributing to job creation and entrepreneurial activity, there may be perceived gaps or uneven access to these opportunities—particularly for women and small-scale entrepreneurs.

As a whole, the overall mean scores on all dimensions of benefits are always positive, highlighting the potential of ecotourism as a developmental instrument that has real benefits accruing to rural and tribal communities.

Still, the variation in scores also hints at the necessity for more participatory and equitable approaches to ensure wider participation and benefit-sharing across various groups, particularly marginalized communities like tribal artisans and women.

Chart 2 Mean Perceptions of Ecotourism: Challenges



Source: Field Survey 2025

Chart 2 illustrates the average responses of tribal participants regarding the negative impacts or challenges associated with ecotourism development, based on a 5-point Likert scale.

From the above chart, we can interpret that the highest mean score was recorded for the statement “*Has Ecotourism increased waste and litter*”, indicating that a significant number of tribal respondents perceive improper waste management as the most pressing challenge associated with ecotourism. This finding also aligns with existing research that highlights environmental degradation, particularly solid waste accumulation, as a major side effect of unregulated or poorly managed tourism development in ecologically sensitive areas.

The indicators “*Has Ecotourism led to conflicts between locals and tourists*”, “*Has Alcoholism or social problems increased*”, and “*Has Noise and disturbance increased during peak seasons*” also recorded high mean scores, reflecting widespread concern over the social disruptions brought by tourism. Such issues are often noted in the literature as unintended consequences of tourism growth in indigenous or rural settings, where traditional norms and community cohesion are easily affected.

Further, “*Has Ecotourism affected wildlife or biodiversity*” and “*Has Prices of food and goods increased*” received moderately high scores, suggesting that tourism is perceived to negatively impact the local environment and contribute to inflation in basic goods and services—potentially making everyday life more expensive for tribal residents.

Conversely, lower ratings were observed for “*Are Forests areas now less accessible*” and “*Are Traditional customs being commercialized*”, suggesting mixed or neutral views regarding the degree to which ecotourism has restricted access to forests or commercialized tribal cultural values. This could be due to either good regulation or localized variations in the way ecotourism is practiced.

The most negative appraisal was that the statement “*Land has been diverted from agriculture to ecotourism*” got the lowest mean score, which means that the overwhelming majority of respondents do not see ecotourism as directly leading to land alienation and displacement. This could be because ecotourism ventures in the Nilgiris are small-scale and community-based and usually do not fall outside current village and forest perimeters without extensive infrastructure development.

Overall, though ecotourism is widely recognized by respondents as a good thing, the chart does show strong perceived environmental and social costs. These findings underscore the importance of more active community participation, improved regulation of tourist activity, and greater environmental protection to reduce the negative impacts and to make ecotourism as truly sustainable and inclusive as possible in tribal territories.

VI. Key Findings:

Objective 1: Population Profile and Gender Gap in Ecotourism Training Disparity by Gender in Training Opportunities:

- A statistically significant correlation ($\chi^2 = 4.154, p = 0.042$) existed between gender and availability of ecotourism-related training.
- Male respondents were more likely to have received training compared to females, highlighting a gender gap in skill development opportunities.
- Fisher’s Exact Test ($p = 0.039$) and Likelihood Ratio ($p = 0.040$) further supported this disparity.
- Implication: Unequal training access may lead to unequal economic benefits, requiring more inclusive programs for tribal women.

Objective 2: Perceptions of Ecotourism Benefits & Challenges

A. Benefits of Ecotourism (High Positive Perceptions)

1. Improved Living Standards – Highest mean score, indicating ecotourism has enhanced quality of life.
2. Income & Livelihood Opportunities – Respondents reported:
 - Increased income due to ecotourism.
 - More livelihood options, reducing dependence on traditional sectors like agriculture.
3. Women’s Economic Participation – Women reported better income opportunities, though scores were slightly lower than overall economic benefits.
4. Job Creation & Entrepreneurship – Ecotourism was seen as supporting local jobs and small businesses, though with some gaps in inclusivity.

B. Ecotourism Challenges (Key Issues)

1. Environmental Degradation – Greatest concern:

- Increased waste and litter generated by tourism activities.
- Medium concern regarding wildlife and biodiversity effects.

2. Social & Cultural Disruptions – Significant issues included:

- Locals vs. tourist’s conflict.
- Increase in alcoholism and social ills.

- Noise pollution during busy tourist seasons.
 - **Economic Inflation** – Some respondents noted higher prices for food and goods, likely due to tourist demand.
- 3. Lower Concerns:**
- Land diversion from agriculture wasn't a key concern, indicating ecotourism has not really replaced traditional land use.
 - Forest access and sale of traditional customs were seen as less of an issue.

VII. Overall Implications

- Ecotourism is mostly seen as positive for the tribal communities, enhancing income, employment, and living conditions.
- Disparities in access to training for women must be resolved to provide fair economic involvement.
- Environmental and social issues (waste, conflict, culture disturbance) need improved regulation and local management.

VIII. Policy Recommendations

- Gender-inclusive training programs for tribal women.
- Stronger waste management and tourist behaviour guidelines.
- Community-led ecotourism models to minimize negative impacts.

IX. Conclusion

This article emphasizes both the two sides of ecotourism in the Nilgiris, as it pictures both how ecotourism has the potential to lift tribal livelihoods as well as the socio-environmental problems it introduces. The interview results indicate strong perceived advantages, specifically better income, increased job opportunities, and improved living standards—validating ecotourism's ability to foster economic resilience among tribal communities. Significantly, numerous tribal men have enjoyed access to training courses, which have prepared them with skills applicable in the tourism industry. There is also a need to provide similar access to tribal women in order to achieve balanced and fair participation. Participants also referred to issues of environmental degradation, growing conflict between tourists and native people, as well as inflationary pressures. These problems underscore the need to embrace firmer regulatory means and neighbourhood-based management practices to ensure a sustainable and balanced ecotourism model.

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