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Visitor Behaviour and Economic Valuation of Spiritual Tourism in Rameshwaram Island, India

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HIGHLIGHTS

- Travel expenditure negatively influenced visitation frequency among spiritual tourists.
- Visitor satisfaction positively affected revisit behaviour and tourism participation.
- Spiritual tourism generated substantial consumer surplus and regional economic benefits.
- Improved tourism infrastructure and awareness programmes supported sustainable pilgrimage tourism.

ARTICLE INFO

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ABSTRACT

The study evaluated visitor behaviour and the economic importance of spiritual tourism in Rameshwaram Island during 2025 using the Individual Travel Cost Method (ITCM). Primary information was obtained from 400 spiritual tourists through a field survey conducted at important pilgrimage centres in the study area. Tourism demand and visitation patterns were estimated using Poisson and Negative Binomial regression approaches. The Negative Binomial specification was found to be more suitable for explaining tourist visitation behaviour. Travel expenditure showed an inverse relationship with visitation frequency, indicating that higher travel costs reduced repeat visits. In contrast, visitor satisfaction positively influenced tourism participation and revisit intention, while income showed a favourable association with tourism demand. The estimated consumer surplus was Rs. 20,833 per trip, reflecting substantial welfare gains derived from spiritual tourism. The findings also indicated that spiritual tourism contributed notably to the regional economy through tourism expenditure and service-related activities. The study emphasised the need for effective tourism planning, visitor awareness programmes, infrastructure improvement and extension support for promoting sustainable spiritual tourism development in Rameshwaram Island.

INTRODUCTION

Spiritual tourism contributes substantially to local economic development through employment generation, livelihood support and preservation of cultural heritage resources (UNWTO, 2024). It has also emerged as an important component of sustainable rural and regional development in several pilgrimage destinations across India (Patial et al., 2025). Pilgrimage centres support economic activities related to hospitality, transport and local commerce. In India, pilgrimage tourism has expanded because of historically important religious destinations (Ministry of Tourism, 2024). Spiritual tourism encompasses travel motivated by religious beliefs, spiritual interests and faith-oriented experiences, where visitors seek personal meaning, spiritual enrichment and participation in sacred

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practices associated with religious destinations. In the context of the present investigation, spiritual tourists referred to pilgrims visiting the Ramanathaswamy Temple and other religious sites in Rameshwaram primarily for worship, pilgrimage and related spiritual activities. Among these destinations, Rameshwaram Island in Tamil Nadu occupies a prominent position because of the religious significance of the Ramanathaswamy Temple and its association with Hindu spiritual traditions. Spiritual tourism generates cultural and social benefits for pilgrims and communities. These activities strengthen cultural identity and enhance visitor experiences (Romanazzi et al., 2023). Since many of these benefits are not directly traded in conventional markets, economic valuation approaches are useful for estimating their contribution to tourism development and policy planning (Yao & Wallace, 2024). Tourism participation is shaped by various socio-economic and behavioural attributes, making their assessment important for destination planning, management and tourism extension initiatives. Similar extension interventions were reported in Indian Agri-tourism and rural tourism studies (Krishna et al., 2019). Multi-stakeholder participation in tourism-linked livelihood promotion was emphasised (Krishna et al., 2021).

Empirical evidence indicates that tourism experience, destination image and visitor satisfaction positively influence revisit intention and tourist participation (Acharya et al., 2023; Sugiama et al., 2024). Tourism expenditure contributes to regional economic growth and sustainability (Cárdenas-García et al., 2024). Increasing tourist arrivals at religious destinations have intensified the need for improved infrastructure and visitor management systems. Despite its growing importance, empirical evidence on visitor behaviour, tourism demand and welfare benefits remains limited in many pilgrimage destinations. Previous studies have mainly focused on destination development, pilgrimage management, visitor satisfaction and revisit intention (Acharya et al., 2023; Sugiama et al., 2024). However, limited attention has been given to the combined assessment of visitor behaviour and the economic value of spiritual tourism through economic valuation approaches. In the context of Rameshwaram Island, information on tourism demand, visitation behaviour and visitor welfare benefits remains scarce, restricting evidence-based planning, infrastructure development and policy formulation. The Travel Cost Method (TCM) is widely used for estimating recreational demand and consumer surplus associated with tourism destinations (Adu et al., 2024; Wubalem et al., 2023). Earlier valuation studies further reported that increasing travel expenditure reduces visitation frequency, whereas improved visitor satisfaction encourages repeat visits (Hashim, 2023; Ramadan & Rantini, 2024). Therefore, the present study investigates visitor behaviour and estimates the economic value of spiritual tourism in Rameshwaram Island using the Individual Travel Cost Method.

METHODOLOGY

The study was purposively undertaken in Rameshwaram Island, Tamil Nadu, owing to its prominence as one of the major pilgrimage destinations attracting visitors throughout the year. Primary data were collected during 2025 from tourists visiting major pilgrimage locations in the study area. A total of 400 spiritual tourists were selected using a convenience sampling method. Data on visitation frequency, travel expenditure, visitor satisfaction, income, education and duration of stay were obtained through a pre-tested interview schedule.

Visitor behaviour was operationalised using visitation frequency, travel expenditure, visitor satisfaction and duration of stay. Visitor satisfaction was measured using a five-point Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied), covering transportation facilities, accommodation, cleanliness, temple facilities, safety and overall pilgrimage experience. Before conducting the statistical analysis, the reliability of the visitor satisfaction scale was evaluated using Cronbach's alpha. The obtained alpha value of 0.78 demonstrated an acceptable degree of internal consistency among the satisfaction-related items, indicating that the scale was sufficiently reliable for further analysis. The interview schedule was pre-tested before the final survey. Respondents aged 18 years and above who visited the destination for pilgrimage purposes and were willing to participate in the survey were included in the sample. Convenience sampling was employed as pilgrims were highly mobile across survey locations, and a comprehensive sampling frame was unavailable. The study was conceptually structured to examine the influence of socio-economic characteristics, travel-related factors and visitor satisfaction on pilgrimage participation behaviour. Tourism demand was represented by visitation frequency and used to derive consumer surplus and economic value.

Tourism demand and welfare benefits were assessed using the Individual Travel Cost Method (ITCM), a commonly used approach for valuing recreational and tourism resources (Mayer & Woltering, 2018; Cetin et al., 2021). The Individual Travel Cost Method is founded on the principles of welfare economics and consumer behaviour theory. The expenditure incurred by visitors to reach and experience a destination is treated as an indirect measure of the value they place on that visit. By examining the relationship between travel expenditure and visitation frequency, a tourism demand function can be estimated, which subsequently enables the calculation of consumer surplus as an indicator of the net welfare benefits derived from the tourism experience.

The tourism demand function was specified as:

$$Trips_i = f(TC_i, Age_i, Income_i, Edu_i, Sat_i, Stay_i)$$

Where, $Trips_i$ denotes the number of visits made by individual i; TC_i represents travel cost; Age_i denotes age; $Income_i$ represents annual income; Edu_i denotes education level; Sat_i represents visitor satisfaction; $Stay_i$ denotes length of stay.

The empirical tourism demand model was expressed as:

$$Trips_i = \beta_0 + \beta_1 TC_i + \beta_2 Age_i + \beta_3 Income_i + \beta_4 Edu_i + \beta_5 Sat_i + \beta_6 Stay_i + \varepsilon_i$$

Where, β_0 is the intercept; β_1, β_2,..., β_6 are parameters to be estimated; ε_i is the random error term.

Since visitation frequency represented count data, Poisson and Negative Binomial regression models were estimated for tourism demand analysis (Hashim, 2023). The Poisson regression model was initially estimated as:

$$E(Trips_i \mid X_i) = \lambda_i$$

However, as the visitation data exhibited over-dispersion, the Negative Binomial regression model was considered more

appropriate. The variance specification was expressed as:

$$Var(Trips_i \mid X_i) = \lambda_i + \alpha\lambda_i^2$$

Where, α represents the over-dispersion parameter. Model selection was based on log-likelihood and Akaike Information Criterion (AIC) values.

Consumer surplus was estimated using the inverse of the travel cost coefficient:

$$CS = -\frac{1}{\alpha_{TC}}$$

where, *CS* denotes consumer surplus per trip and α_{TC} represents the travel cost coefficient.

The recreation value per visitor was estimated as:

$$RV_{visitor} = CS \times \overline{V}$$

Where, $RV_{visitor}$ denotes recreation value per visitor; CS represents consumer surplus per trip; $\overline{V}$ denotes the average number of visits.

The total recreation value generated through spiritual tourism was estimated as:

$$TRV = CS \times N$$

Where, *TRV* represents total recreation value and *N* denotes annual visitor arrivals. Descriptive statistics were used to examine visitor and travel characteristics, whereas Poisson and Negative Binomial regression models were applied to estimate tourism demand. Consumer surplus and recreation value were subsequently derived using the Individual Travel Cost Method. The data were analysed using IBM SPSS Statistics Version 29.0.0.0.

RESULTS

Visitor behaviour and tourism demand

Table 1 summarised the descriptive statistics relating to spiritual tourism variables collected from pilgrims visiting Rameshwaram Island. The average visitation frequency was estimated at 2.35 trips annually, whereas the mean travel expenditure per trip amounted to Rs. 4520.40. Pilgrims reported a satisfaction score of 4.70 and the average duration of stay was estimated at 1.80 days. The findings showed repeated pilgrimage participation because of the religious importance and cultural relevance of the destination. Pilgrims reported a comparatively higher level of satisfaction with their overall pilgrimage experience.

The comparative performance of the Poisson and Negative Binomial specifications was presented in Table 2. The Negative Binomial model recorded a comparatively higher log-likelihood value (-206.92) and lower Akaike Information Criterion (AIC) value (427.84), indicating improved explanatory performance for tourism visitation behaviour. The estimated over-dispersion parameter (Alpha = 0.41) suggested that the variance exceeded the corresponding mean value of visitation frequency, thereby supporting the suitability of the Negative Binomial specification for tourism demand estimation. The findings indicated that visitation data associated with spiritual tourism exhibited over-dispersion, making the Poisson specification comparatively less suitable for analysing tourism participation behaviour. The Negative Binomial model, therefore, provided a more reliable explanation of pilgrimage tourism demand in the study area. The results confirmed the suitability of the Negative Binomial model for analysing tourism participation behaviour.

The estimated coefficients of the Negative Binomial tourism demand model were presented in Table 3. Travel expenditure showed a negative and significant relationship with visitation frequency. The estimated travel cost coefficient (-0.000048) indicated that increasing travel expenditure reduced pilgrim visits to Rameshwaram

Table 2. Model Selection for Tourism Demand

Indicator	Poisson	Negative Binomial	Preferred Model
Log Likelihood	-212.47	-206.92	Negative Binomial
AIC	438.94	427.84	Negative Binomial

Source: Author's computation (2025)

Table 3. Negative Binomial Estimates of Spiritual Tourism Demand

Variables	Coefficient	Std. Error	z-value	p-value
Travel Cost	-0.000048***	0.000013	-3.69	0.000
Age	0.019***	0.007	2.71	0.007
Income	0.000003	0.000004	0.75	0.454
Education Level	0.041	0.044	0.93	0.352
Satisfaction	0.296***	0.068	4.35	0.000
Length of Stay	0.107***	0.040	2.68	0.007
Constant	0.871***	0.269	3.24	0.001
Log Likelihood	-206.92	-	-	-
LR Chi-square	63.14	-	-	-
Prob > Chi²	0.000	-	-	-
Pseudo R²	0.132	-	-	-
Alpha (Overdispersion)	0.41	-	-	-

Note: *** Significant at p < 0.01
Source: Author's computation (2025)

Table 1. Descriptive Statistics of Spiritual Tourism Variables (n=400)

Variable	Description	Mean	Std. Dev.	Min	Max
Trips per Year	Number of annual visits	2.35	1.32	1	6
Travel Cost (Rs.)	Total expenditure per trip	4520.40	1758.60	1200	7800
Age (Years)	Age of respondents	38.90	10.15	22	58
Income (Rs. lakh/year)	Annual household income	3.07	1.01	1.04	5.40
Education Level	Educational attainment	3.20	1.02	1	4
Satisfaction	Visitor satisfaction score	4.70	0.64	3	5
Length of Stay (Days)	Duration of stay	1.80	0.73	1	3

Source: Primary survey data (2025)

Island. The lower coefficient magnitude suggested comparatively less sensitivity of spiritual tourism demand to moderate travel cost variations. Age recorded a positive and significant relationship with tourism participation, indicating comparatively higher visitation among older pilgrims. Income and education level showed positive but statistically non-significant relationships with visitation behaviour. Tourist satisfaction emerged as an important factor influencing visitation behaviour. The positive and significant coefficient (0.296) suggested that satisfactory tourism experiences and improved visitor facilities encouraged repeat visitation. Length of stay also showed a positive association with tourism participation. Overall, the regression estimates indicated that spiritual tourism demand was influenced by economic, demographic and experiential factors, with tourist satisfaction exerting a comparatively stronger effect on visitation behaviour.

The marginal effects estimated from the Negative Binomial model were presented in Table 4. Tourist satisfaction produced the highest positive marginal effect (0.584), indicating that improved visitor experience considerably increased expected visitation frequency. Travel expenditure generated a negative marginal effect (-0.000096), confirming the inverse association between travel expenditure and tourism participation. Age and duration of stay positively influenced visitation behaviour, whereas income and education level were not statistically significant. The findings showed that experiential and behavioural factors played an important role in shaping tourism participation in pilgrimage destinations.

Table 4. Marginal Effects of Tourism Demand Variables

Variables	Marginal Effect	Std. Error	z-value	p-value
Travel Cost	-0.000096***	0.000025	-3.84	0.000
Age	0.038***	0.014	2.71	0.007
Income	0.000006	0.000007	0.86	0.389
Education Level	0.082	0.088	0.93	0.352
Satisfaction	0.584***	0.136	4.29	0.000
Length of Stay	0.211***	0.078	2.70	0.007

Note: *** Significant at p < 0.01; *Source:* Author's computation (2025)

Welfare estimates and economic value of spiritual tourism

The elasticity estimates were presented in Table 5. The estimated travel cost elasticity value (-0.217) indicated relatively inelastic tourism demand, suggesting that pilgrimage tourism participation remained less responsive to moderate variations in travel expenditure. The lower responsiveness to travel cost reflected the influence of spiritual motivation and religious attachment on visitation decisions. These results further showed that pilgrimage tourism participation in Rameshwaram Island was influenced more strongly by religious and cultural motivations than by economic considerations.

Table 5. Travel Cost Demand Elasticity

Tourism Type	Travel Cost Coefficient	Mean Travel Cost (Rs.)	Elasticity
Spiritual Tourism	-0.000048	4520.40	-0.217

Source: Author's computation (2025)

The semi-elasticity estimates shown in Table 6 indicated that a Rs. 1000 increase in travel expenditure reduced visitation frequency by nearly 4.8 per cent. The estimates demonstrated comparatively stable pilgrimage participation despite moderate increases in travel-related expenditure. The findings indicated that pilgrimage tourism participation remained comparatively less sensitive to moderate changes in travel expenditure because of spiritual motivation and religious commitment among visitors.

Table 6. Tourism Demand Semi-Elasticity

Tourism Type	Travel Cost Coefficient	Change in Trips for Rs. 1000 Increase
Spiritual Tourism	-0.000048	-4.8%

Source: Author's computation (2025)

The welfare estimates associated with spiritual tourism were presented in Table 7. The estimated consumer surplus per trip amounted to Rs. 20,833, reflecting welfare benefits obtained by pilgrims beyond actual travel expenditure. The annual consumer surplus per visitor was estimated at Rs. 48,958, while the aggregate consumer surplus generated through spiritual tourism was estimated at Rs. 17,708 crores. These estimates highlighted the economic significance of pilgrimage tourism through tourism-related expenditure and associated service-sector activities in the study area.

Figure 1 illustrates the recreation demand curve for spiritual tourism in Rameshwaram Island. The downward-sloping curve indicates that visitation frequency declines as travel expenditure increases, confirming the inverse relationship between travel cost and tourism demand. The shaded area beneath the curve represents consumer surplus, reflecting the welfare benefits obtained by pilgrims beyond their actual travel expenditure. The relatively gentle slope further suggests that spiritual tourism demand is less responsive to moderate changes in travel expenditure.

The summary welfare indicators relating to spiritual tourism were provided in Table 8. The estimates indicated comparatively higher visitation frequency, lower price sensitivity and substantial welfare gains associated with pilgrimage tourism activities. The estimated total consumer surplus further demonstrated the economic importance of spiritual tourism in supporting tourism-linked services and regional economic activities. The findings collectively indicated that spiritual tourism in Rameshwaram Island generated notable welfare and economic benefits through tourism expenditure, tourism participation and pilgrimage-related activities.

Table 7. Consumer Surplus and Economic Value of Spiritual Tourism

Tourism Site	Travel Cost Coefficient	Consumer Surplus per Trip (Rs.)	Annual Visitors	Total Consumer Surplus (Rs. crore)
Spiritual Tourism	-0.000048	20,833	8,500,000	17,708.00

Source: Author's computation (2025)

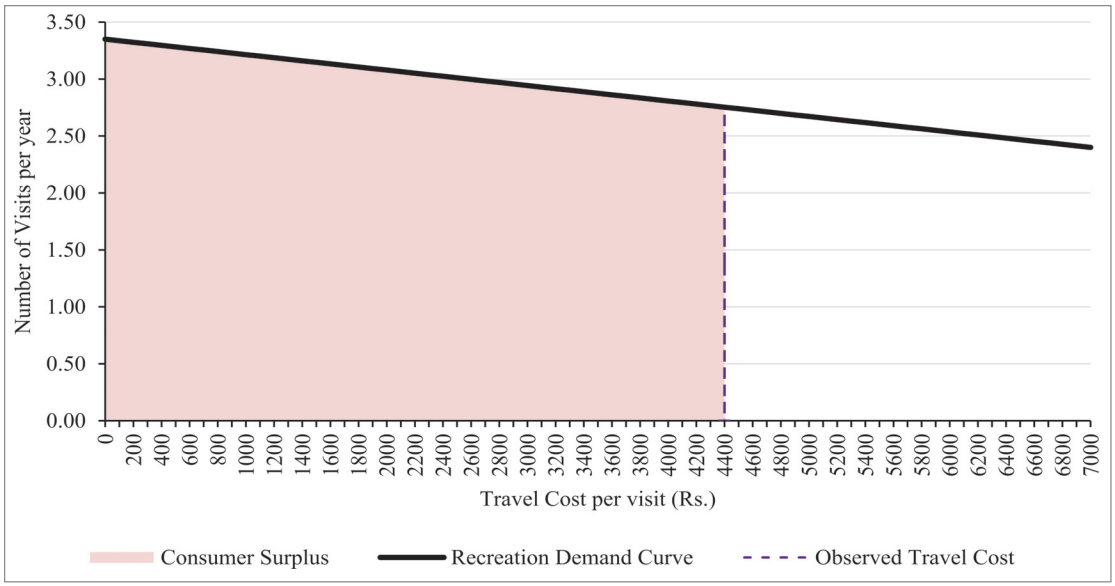

Figure 1. Recreation demand curve with consumer surplus for spiritual tourism

Table 8. Summary of Welfare and Demand Indicators

Indicator	Spiritual Tourism
Mean Trips per Year	2.35
Mean Travel Cost (Rs.)	4520.40
Travel Cost Coefficient	-0.000048
Travel Cost Elasticity	-0.217
Semi-Elasticity (Trips change for Rs. 1000 increase)	-4.8%
Consumer Surplus per Trip (Rs.)	20,833
Average Annual Trips	2.35
Annual Consumer Surplus per Visitor (Rs.)	48,958
Annual Visitors	8,500,000
Total Consumer Surplus (Rs. crore)	17,708

DISCUSSION

Pilgrimage travel is often driven by faith-based motivations that extend beyond conventional recreational considerations, encouraging visitors to maintain a continued connection with spiritually significant destinations. The model selection results indicated that the Negative Binomial model provided a comparatively better explanation of tourism visitation behaviour than the Poisson specification because of over-dispersion in visitation data, thereby supporting the suitability of count-data regression approaches for tourism demand estimation (Hashim, 2023; Ramadan & Rantini, 2024). The negative association observed between travel expenditure and visitation frequency indicated that increasing travel costs reduced tourism participation. This relationship is consistent with economic demand theory, which suggests that participation tends to decline as the cost of accessing a service or destination increases. However, the comparatively lower elasticity value suggested that spiritual tourism demand remained relatively stable despite moderate increases in travel expenditure. This indicates that pilgrimage decisions were influenced not only by monetary considerations but also by faith, religious commitment and spiritual fulfilment. Such non-economic motivations may reduce visitor sensitivity to travel expenditure and contribute to relatively stable visitation behaviour, which is consistent with the observations of Yao and Wallace (2024). Tourist satisfaction showed a positive influence on revisit behaviour, indicating that satisfactory tourism experiences encouraged repeated visitation among pilgrims. A favourable pilgrimage experience can enhance perceived benefits, strengthen emotional attachment to the destination and increase the likelihood of future visits. Visitor satisfaction therefore acts as an important behavioural factor that reinforces destination loyalty and continued tourism participation. The positive role of visitor satisfaction in encouraging destination loyalty and repeat visitation has also been documented by Kim (2018) and Sugiama et al. (2024). The positive relationship observed between duration of stay and tourism participation suggested that pilgrims spending comparatively longer periods at the destination were more likely to revisit spiritual tourism sites. Longer stays may provide greater opportunities for spiritual engagement, participation in religious activities and interaction with the cultural environment. These experiences can strengthen destination attachment and encourage future pilgrimage participation (Romanazzi et al., 2023; Santos et al., 2021). The marginal effects further confirmed the dominant influence of visitor satisfaction on pilgrimage tourism participation. These findings emphasised the importance of improving visitor experience, tourism facilities and support services for sustaining pilgrimage tourism participation.

The welfare estimates highlighted the substantial benefits generated through spiritual tourism activities in Rameshwaram Island. The recreation demand curve illustrated the inverse relationship between travel expenditure and visitation frequency, while the comparatively flatter demand curve indicated lower sensitivity of spiritual tourism demand to moderate increases in travel expenditure. The shaded consumer surplus area represented substantial welfare benefits obtained by pilgrims beyond actual travel expenditure. From a welfare economics perspective, consumer surplus represents the difference between the value perceived by visitors and the actual expenditure incurred to access a destination. The comparatively high consumer surplus estimated in the present study suggests that pilgrims derived substantial benefits from the pilgrimage experience that extended beyond the direct costs incurred

during travel. These benefits included spiritual fulfilment, cultural enrichment, emotional attachment and personal satisfaction associated with visiting sacred destinations. The distinctive nature of pilgrimage tourism implies that travel decisions are influenced not only by economic considerations but also by faith, devotion and religious commitment. Consequently, the overall value perceived by pilgrims may exceed actual travel expenditure, resulting in higher welfare gains and consumer surplus estimates. These findings highlight the broader social, cultural and spiritual value generated through participation in spiritual tourism activities. Comparable evidence relating to recreation demand and welfare benefits was reported by Adu et al. (2024). The aggregate consumer surplus highlighted the contribution of spiritual tourism towards tourism-linked enterprises, local livelihood opportunities and regional service-sector activities. Higher consumer surplus values indicate that visitors attach considerable value to their participation in spiritual tourism activities, thereby reflecting the broader economic and social significance of pilgrimage destinations (Parsons, 2017). Comparable welfare benefits associated with tourism valuation were reported by Wubalem et al. (2023), while Cárdenas-García et al. (2024) documented the contribution of tourism activities towards regional economic development and livelihood support. From an extension education perspective, the findings offer valuable insights for developing awareness initiatives, visitor information support and community-oriented tourism programmes. The evidence generated through the assessment of visitor behaviour and economic value can assist extension personnel, local institutions and tourism stakeholders in designing educational activities, encouraging community involvement and promoting sustainable tourism practices in pilgrimage destinations. Strengthening tourism information dissemination systems, sanitation awareness campaigns and tourism-related support services could improve visitor satisfaction and promote sustainable tourism development. Community participation and stakeholder engagement can further support effective destination management and enhance the long-term sustainability of pilgrimage tourism. Capacity-building initiatives for local stakeholders and tourism service providers may further strengthen destination management and improve the quality of services offered to visitors. Similar stakeholder-oriented and participatory tourism approaches were emphasised by Slathia et al. (2015) and Krishna et al. (2021). The findings therefore suggested that strengthening tourism infrastructure, sanitation management systems, visitor guidance services and extension-based awareness programmes could contribute towards sustainable spiritual tourism development and effective management of pilgrimage destinations in the study area.

CONCLUSION

The study analysed the economic contribution and visitation behaviour related to spiritual tourism in Rameshwaram Island by applying the Individual Travel Cost Method. The results indicated that increasing travel expenses reduced the frequency of tourist visits, while positive visitor experience and satisfaction encouraged revisits and greater tourism involvement. The Negative Binomial regression model was found appropriate for interpreting tourism demand because the visitation pattern varied considerably among respondents. The estimated consumer surplus of Rs. 20,833 per visit reflected the welfare benefits obtained by pilgrims through spiritual tourism activities. The findings also showed that pilgrimage tourism supported regional economic growth through transportation services, accommodation facilities, local business activities and tourism-related employment opportunities. Strengthening tourism infrastructure, sanitation practices, visitor guidance services, awareness activities, stakeholder coordination and community participation would therefore help improve pilgrimage management, enhance visitor satisfaction and support sustainable spiritual tourism development in the study area over the long term.

DECLARATIONS

Ethics approval and informed consent: Throughout the study, the respondents were asked for their informed consent.

Conflict of interest: The research was carried out without any financial or commercial ties that might be seen as a potential conflict of interest, according to the authors. The authors affirm that they carefully examined, amended and edited the content as necessary when preparing this work. The final content of this publication is entirely the authors' responsibility.

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