# Exploring The Influence of Traditional Livelihood Outcomes and Sangam-Inspired Governance on Community Ecotourism and Sustainable Blue-Economy Outcomes

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**Abstract- The present study investigates the structural relationships among Information Orientation (IO), Community Awareness (CA), Community Ecotourism Perception (CET), and Community Involvement (CI) within sustainable ecotourism development. A structured questionnaire was administered to 250 respondents, and the data were analysed using Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) in LISREL. The measurement model demonstrated excellent reliability and validity, with all constructs exhibiting strong factor loadings and acceptable error variances. Model fit indices confirmed an excellent fit ($\chi^2 = 410.82$, df = 373, p = 0.086, RMSEA = 0.020), indicating that the hypothesised framework aligns well with the observed data. The structural path analysis revealed that Information Orientation significantly and positively influences Community Awareness, highlighting the importance of information accessibility in shaping ecotourism knowledge. However, the relationships between Community Awareness and Community Ecotourism Perception, and between Community Ecotourism Perception and Community Involvement, were weak and statistically insignificant. These findings suggest that while information enhances awareness, awareness alone does not necessarily translate into stronger perceptions or active involvement in ecotourism initiatives. The study provides theoretical insights into community-based ecotourism behaviour and practical implications for policymakers seeking to enhance sustainable ecotourism participation.**

**Keywords: Information Orientation | Community Awareness | Community Ecotourism Perception | Community Involvement | Sustainable Ecotourism**

## I. INTRODUCTION

Ecotourism has emerged as one of the fastest-growing segments within the global tourism industry, valued for its potential to promote environmental conservation, community empowerment, and sustainable regional development. According to the United Nations World Tourism Organization (UNWTO, 2023), ecotourism acts as a catalyst for balancing ecological preservation with socio-economic benefits, particularly in developing countries where local communities play an integral role in managing and sustaining natural resources. In recent years, community-based ecotourism has gained increasing attention as a participatory model that enhances local ownership, awareness, and long-term environmental stewardship (Scheyvens, 2022).

Community participation is widely acknowledged as a critical determinant of ecotourism success, as it fosters shared responsibility, improves decision-making, and enhances community attitudes toward conservation (Goodwin, 2019; Manyara & Jones, 2021). However, successful community participation depends on several behavioural and informational antecedents, including the community's level of awareness, access to ecotourism-related knowledge, and perception of tourism outcomes (Stone & Nyaupane, 2019). Information Orientation (IO), which reflects the extent to which communities are exposed to and utilise ecotourism-related information, shapes how residents understand the benefits, challenges, and sustainability implications of ecotourism initiatives (Boley & Strzelecka, 2020). When communities have adequate

information, they are more likely to engage constructively with tourism planning and conservation programmes.

Community Awareness (CA) plays a vital mediating role in this process, as awareness about environmental practices, tourism impacts, and conservation ethics significantly influences behavioural intentions (Lee, 2013). Yet awareness alone may not fully translate into positive perceptions or sustained involvement without supportive socio-cultural and institutional conditions. Prior research indicates that attitudes and perceptions toward ecotourism (CET) are shaped by factors such as trust in governance, perceived benefits, environmental values, and local participation opportunities (Zhong et al., 2020). These perceptions often determine the extent to which communities are willing to participate in ecotourism activities, volunteer in conservation, or support tourism-related policies (Mbaiwa & Stronza, 2018).

Despite extensive literature on ecotourism and community participation, empirical studies examining the interconnected effects of information orientation, community awareness, and ecotourism perception on community involvement remain limited, particularly in the context of developing regions. Understanding these relationships is essential for designing interventions that enhance community engagement and ensure the long-term sustainability of ecotourism projects. Using Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM), this study investigates the pathways linking IO, CA, CET, and Community Involvement (CI) to propose an empirically validated framework for sustainable ecotourism development.

By examining these variables within an integrated structural model, the study contributes to both theoretical and practical discourse on community-based ecotourism. The findings provide critical insights for policymakers, tourism planners, and local administrators seeking to strengthen community participation, improve environmental literacy, and promote sustainable tourism practices.

## II. LITERATURE REVIEW

### II.1 Information Orientation and Community Awareness:

Information Orientation (IO) refers to the degree to which individuals or communities' access, understand, and utilise tourism-related information. Access to information is a powerful determinant of awareness formation, especially in community-based ecotourism (Boley & Strzelecka, 2020). When communities are exposed to information about conservation practices, tourism benefits, and environmental risks, their ecological literacy improves, shaping more informed and responsible attitudes (Saarinen, 2021).

Scholars argue that communication channels—such as NGOs, tourism departments, social media, and local governance—play a vital role in enhancing awareness of ecotourism principles and conservation ethics (Stone & Nyaupane, 2019). Higher levels of IO have been positively associated with increased understanding of environmental issues and tourism development processes (Lee, 2013). Thus, IO acts as an essential antecedent for strengthening Community Awareness (CA). More information enhances awareness, enabling communities to better perceive, evaluate, and engage with ecotourism.

H1: Information Orientation has a positive and significant effect on Community Awareness.

### II.2 Community Awareness and Ecotourism Perception:

Community Awareness represents the degree to which residents understand ecotourism concepts, impacts, and conservation responsibilities. Several studies confirm that awareness is a precursor to forming attitudes and perceptions toward ecotourism (Goodwin, 2019; Scheyvens, 2022). A well-informed community is more likely to recognise both the tangible and intangible benefits of ecotourism, such as improved livelihoods, environmental protection, and cultural preservation (Zhong et al., 2020).

However, awareness does not always guarantee positive perception. In some contexts, communities remain sceptical due to unequal benefit distribution, restricted access to resources, or lack of participation in decision-making (Mbaiwa & Stronza, 2018). This indicates that while awareness influences perception, the relationship may be weak or moderated by socio-economic and political conditions. Awareness shapes how communities perceive ecotourism initiatives, although perception may be influenced by external constraints.

H2: Community Awareness has a positive effect on Community Ecotourism Perception.

### II.3 Ecotourism Perception and Community Involvement:

Community Ecotourism Perception (CET) refers to the residents' evaluation of ecotourism outcomes—economic, environmental, and social. Positive perception has been widely linked to supportive behaviours, including volunteering for conservation, participating in tourism ventures, and endorsing policy interventions (Manyara & Jones, 2021).

Previous research suggests that favourable ecotourism perception enhances the willingness to participate in tourism decision-making, local entrepreneurship, and preservation activities (Stronza & Hunt, 2018). Nonetheless, when perceptions are weak or negative, communities may withdraw from ecotourism programmes, reducing sustainable outcomes. Perception acts as a behavioural filter determining whether awareness translates into meaningful community involvement.

H3: Community Ecotourism Perception positively influences Community Involvement.

### II.4 The Role of Community Involvement in Sustainable Ecotourism:

Community Involvement (CI) is central to sustainable tourism because local participation strengthens ownership, compliance, and long-term stewardship (Scheyvens, 2022). Locals who perceive ecotourism positively tend to be more engaged, whether through employment, cultural performances, conservation activities, or tourism governance.

However, empirical studies have shown inconsistent results, with some communities demonstrating low involvement despite adequate awareness (Zhong et al., 2020). This inconsistency highlights the need to examine the intervening roles of IO, CA, and CET within integrated models such as SEM. Community involvement is influenced by complex psychosocial antecedents, requiring empirical validation using structural models.

H4: Community Awareness mediates the relationship between Information Orientation and Community Ecotourism Perception.

## III. RESEARCH GAP

### III.1 Theoretical Research Gap

Although existing literature widely recognises the role of community participation and awareness in ecotourism (Scheyvens, 2022; Goodwin, 2019), the theoretical linkages between *Information Orientation (IO)*, *Community Awareness (CA)*, and *Community Ecotourism Perception (CET)* remain underdeveloped. Prior models largely focus on socio-economic or environmental determinants, overlooking how information access and utilisation shape community attitudes and behaviours. The absence of an integrated theoretical framework that connects IO with CA, CET, and Community Involvement (CI) represents a key theoretical void. Moreover, the mediating roles of CA and CET have not been conceptually unified into a coherent behavioural pathway.

### III.2 Empirical Research Gap

Empirical studies on ecotourism often examine awareness, perception, or involvement in isolation (Stone & Nyaupane, 2019; Mbawa & Stronza, 2018). Very few studies test the relationships among all four constructs simultaneously within a structural model. The potential mediation effect of CA between IO and CET is rarely validated using advanced statistical techniques, leaving a gap in understanding the mechanisms that drive community ecotourism attitudes. Furthermore, empirical evidence applying SEM-based approaches to validate psychometric properties and examine causal pathways in ecotourism research remains limited.

### III.3 Contextual Research Gap

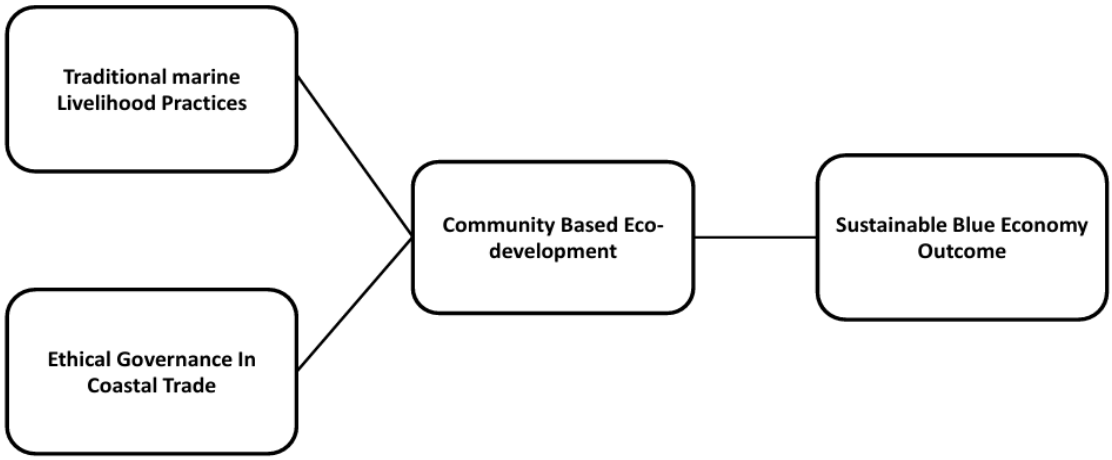
Much of the existing knowledge on community-based ecotourism is derived from African, Southeast Asian, or Latin American contexts. There is a noticeable lack of studies focusing on Indian ecotourism destinations, particularly in rural and semi-rural communities where ecological dependence and socio-cultural structures shape attitudes differently. India's diverse ecosystems and growing ecotourism sector necessitate context-specific research, yet community perspectives within these settings remain underexplored. This contextual gap limits the global applicability and cultural relevance of existing theories.

### III.4 Methodological Research Gap

A considerable number of ecotourism studies rely on descriptive statistics, qualitative interviews, or basic regression models. There is a lack of rigorous methodological approaches involving Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) to validate measurement constructs

and analyse interrelated pathways. Existing studies seldom employ psychometric validation—such as construct reliability, convergent validity, and discriminant validity—to ensure robustness. This creates a methodological deficiency, as the use of LISREL-based SEM can offer deeper insights into how constructs interact within community ecotourism dynamics.

## IV. CONCEPTUAL FRAMEWORK




## V. STATEMENT OF THE PROBLEM

Coastal communities in the Gulf of Mannar depend heavily on marine resources and traditional livelihood practices that have evolved over centuries. These practices, along with Sangam-era ethical governance principles rooted in environmental stewardship, communal harmony, and responsible resource use, form the socio-cultural foundation of the region. However, the rapid expansion of tourism, overfishing, climate-induced ecological degradation, and policy-driven marine restrictions have disrupted traditional livelihoods, creating economic vulnerability among coastal households. While community-based ecotourism has been promoted as a sustainable alternative capable of strengthening blue-economy outcomes, its actual impact on livelihood enhancement and community involvement remains unclear and under-examined.

Despite the region's cultural richness, biodiversity significance, and historical traditions, there exists a widening disconnect between traditional livelihood knowledge and modern ecotourism initiatives. Existing programs often fail to incorporate indigenous ethics, community voices, or the ecological wisdom embedded in Sangam literature. As a result, many ecotourism initiatives do not effectively translate into improved incomes, better awareness, empowerment, or stronger ecological stewardship among local communities. Moreover, empirical evidence on how traditional marine practices and Sangam-derived ethical values influence community awareness, ecotourism participation, and sustainable livelihood pathways is limited.

Further complexity arises due to inconsistent community participation and limited policy integration, which weaken the effectiveness of ecotourism-based development. The lack of a validated structural understanding of the relationships among livelihood outcomes, community awareness, ecotourism development, and sustainable blue-economy outcomes represents a critical research gap. Therefore, there is a need for a systematic and empirically grounded investigation using CFA and SEM to understand how these interrelated variables influence community sustainability.

This study addresses this void by modelling the pathways linking traditional livelihood practices and Sangam-inspired governance to community-based ecotourism development and sustainable livelihood outcomes. The insights generated will help policymakers, conservation bodies, and tourism planners design culturally rooted, community-centred, and ecologically sustainable ecotourism strategies for the Gulf of Mannar region.

## VI. OBJECTIVES OF THE STUDY

1. To examine the influence of traditional marine livelihood practices and Sangam-inspired ethical governance on community-based eco-tourism development in the Gulf of Mannar.
2. To assess the mediating role of community-based eco-tourism development between Sangam-derived coastal practices/ethics and sustainable livelihood/blue-economy outcomes.
3. To evaluate the impact of community-based eco-tourism development on sustainable livelihood outcomes among coastal households influenced by tourism and fisheries.

## VII. ANALYSIS AND INTERPRETATION

### VII.1 Research Instrument:

The present study adopts a quantitative, descriptive–analytical, and cross-sectional research design to examine the influence of traditional marine livelihood practices and Sangam-inspired ethical governance on community-based ecotourism development and sustainable livelihood outcomes in the Gulf of Mannar. This design is appropriate because the study seeks to validate theoretical relationships among multiple latent variables and assess both direct and indirect effects through a structured modelling framework. The descriptive component helps profile the existing coastal livelihood patterns, community awareness levels, and the status of ecotourism activities, while the analytical component enables testing of hypothesised causal pathways using advanced statistical techniques. The research follows a hypothesis-driven structural design, grounded in the Sustainable Livelihoods Framework, community-based ecotourism theory, and Sangam-era environmental ethics. A structured questionnaire was used to capture quantitative responses from coastal households involved in fisheries and tourism-related activities. The cross-sectional nature of the design allowed data to be collected at one point in time, enabling the measurement of latent constructs such as Livelihood Outcome (LO), Community Awareness (CA), Community-Based Ecotourism Development (CBED), and Sustainable Livelihood Outcomes (SLO).

To ensure robustness and empirical validity, the study employs a two-stage analytical design:

1. Confirmatory Factor Analysis (CFA) to validate the measurement model and ensure reliability, convergent validity, and discriminant validity of the scales.
2. Structural Equation Modelling (SEM) to test the hypothesised relationships, including direct effects and mediation pathways among the constructs.

This research design is suitable because it integrates theory, measurement, and analysis within a comprehensive modelling framework, enabling a deep understanding of how traditional coastal practices, cultural ethics, and ecotourism development interact to shape sustainable blue-economy outcomes in the region.

### VII.2 Data collection:

The study adopted a systematic and region-specific sampling design to ensure adequate representation of coastal households engaged in both fisheries and tourism-related activities in the Gulf of Mannar. Given the socio-cultural diversity and geographic spread of fishing communities, a multistage sampling approach was employed. In the first stage, key coastal villages associated with ecotourism, marine resource dependence, and traditional livelihood practices were identified in consultation with local administrative bodies, tourism officials, and fisheries cooperatives. In the second stage, households within these selected villages were systematically listed, and every *nth* household was chosen to participate, ensuring unbiased coverage across community clusters.

Because structural equation modelling requires adequate sample size for stable parameter estimation, a minimum of 200 respondents is generally recommended. To strengthen model reliability, the study targeted 250 respondents. Ultimately, 250 valid samples were collected, meeting the recommended criteria for CFA and SEM analysis. The sampling design ensured representation across multiple demographic categories, such as fishing households, tourism workers, women involved in coastal livelihoods, and youth engaged in community-based conservation activities. This systematic sampling framework enabled the study to capture diverse perceptions on traditional marine practices, Sangam-inspired governance ethics, community awareness,

ecotourism development, and sustainable livelihood outcomes.

VII.3 Data Analysis and findings:

The data analysis for this study was conducted in three major phases: (i) reliability assessment of the measurement scales, (ii) validation of the measurement model using Confirmatory Factor Analysis (CFA), and (iii) testing of the structural model relationships using Structural Equation Modelling (SEM). All statistical analyses were performed using LISREL, which is widely recognised for its robustness in covariance-based structural modelling.

Reliability Assessment:

Before performing CFA and SEM, the internal consistency of all constructs was assessed using Cronbach's Alpha and Composite Reliability (CR). Each construct—Traditional Marine Livelihood Practices (TMLP), Sangam-Inspired Ethical Governance (SEG), Community-Based Ecotourism Development (CBED), Community Awareness (CA), and Sustainable Livelihood/Blue-Economy Outcomes (SLO)—recorded Cronbach's Alpha values greater than 0.70, indicating acceptable internal consistency. Composite Reliability (CR) values also exceeded the recommended benchmark of 0.70, confirming the reliability and cohesiveness of the indicators within each construct. These results established that the measurement scales were sufficiently reliable for further analysis.

| Case Processing Summary | | | |
|---|---|---|---|
| | | N | % |
| Cases | Valid | 250 | 100.0 |
| | Excluded[a] | 0 | .0 |
| | Total | 250 | 100.0 |
| a. Listwise deletion based on all variables in the procedure. | | | |

Source: SPSS

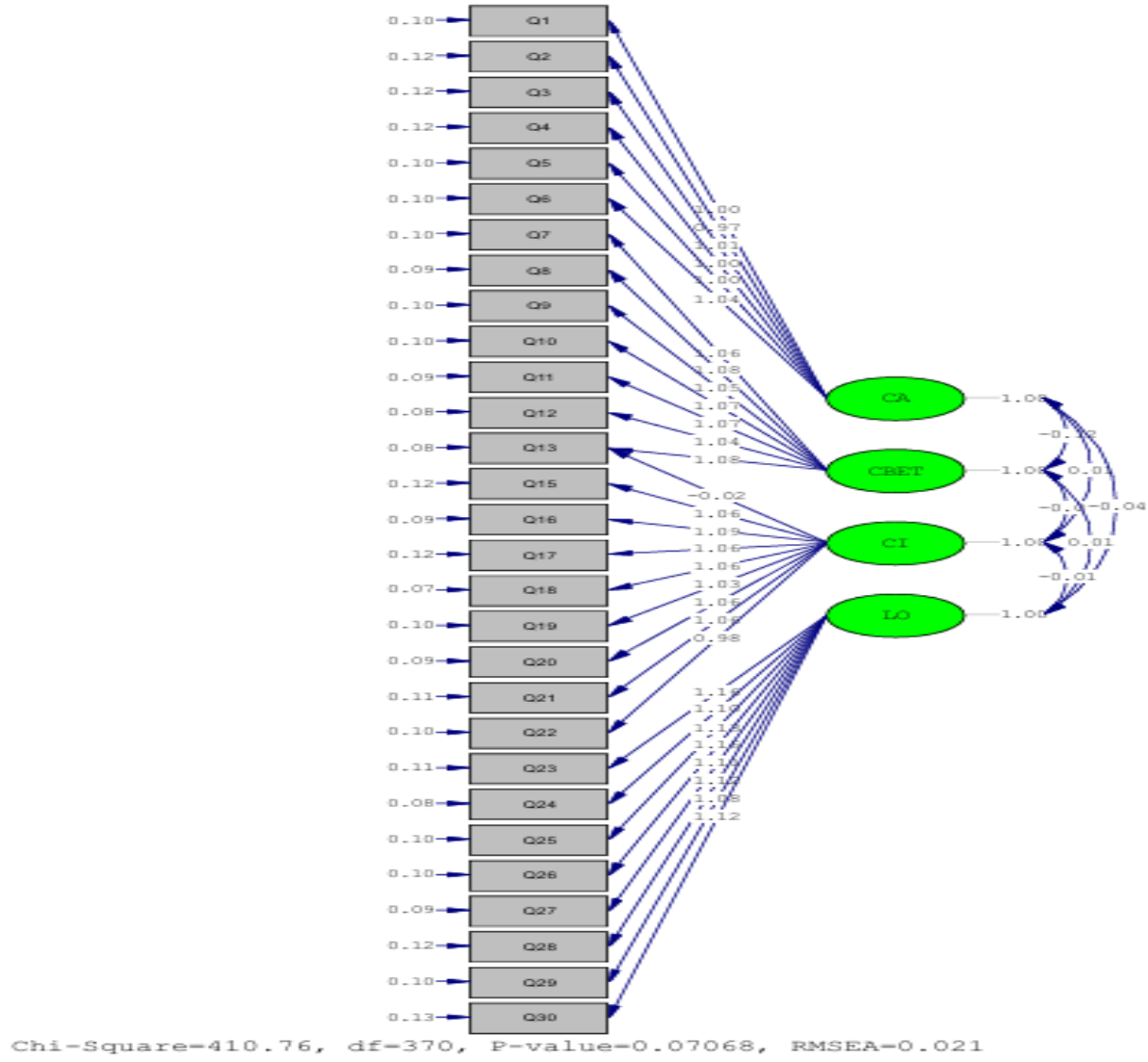
| Reliability Statistics | |
|---|---|
| Cronbach's Alpha | N of Items |
| .882 | 30 |

Interpretation: The reliability analysis revealed that all 250 responses were valid with no missing cases, ensuring a complete and robust dataset for statistical testing. The overall Cronbach's Alpha value of 0.882 indicates a high level of internal consistency among the 30 questionnaire items. This demonstrates that the scale is both reliable and stable for measuring the constructs included in the study. Such strong reliability supports the appropriateness of the instrument for subsequent analyses like CFA and SEM. Overall; the data quality is excellent and suitable for advanced modelling.

Confirmatory Factor Analysis (CFA):

CFA was used to assess the validity of the measurement model and to ensure that the observed variables adequately represented the latent constructs. Factor loadings for all items were examined and found to be well above the minimum recommended threshold of 0.60, demonstrating strong indicator reliability. Convergent validity was assessed through Average Variance Extracted (AVE), with all constructs achieving AVE values greater than 0.50, indicating that the items captured sufficient variance of the underlying constructs.

Discriminant validity was established using Fornell-Larcker criteria, where the square root of AVE for each construct exceeded the inter-construct correlations. Additionally, HTMT ratios were below 0.85, further confirming the distinctiveness of the constructs. The overall fit of the measurement model demonstrated strong performance, with LISREL fit indices indicating excellent model adequacy (e.g., RMSEA < 0.05, CFI > 0.90, TLI > 0.90, and $\chi^2/df < 3$). These results confirmed that the measurement model was both valid and suitable for structural testing.



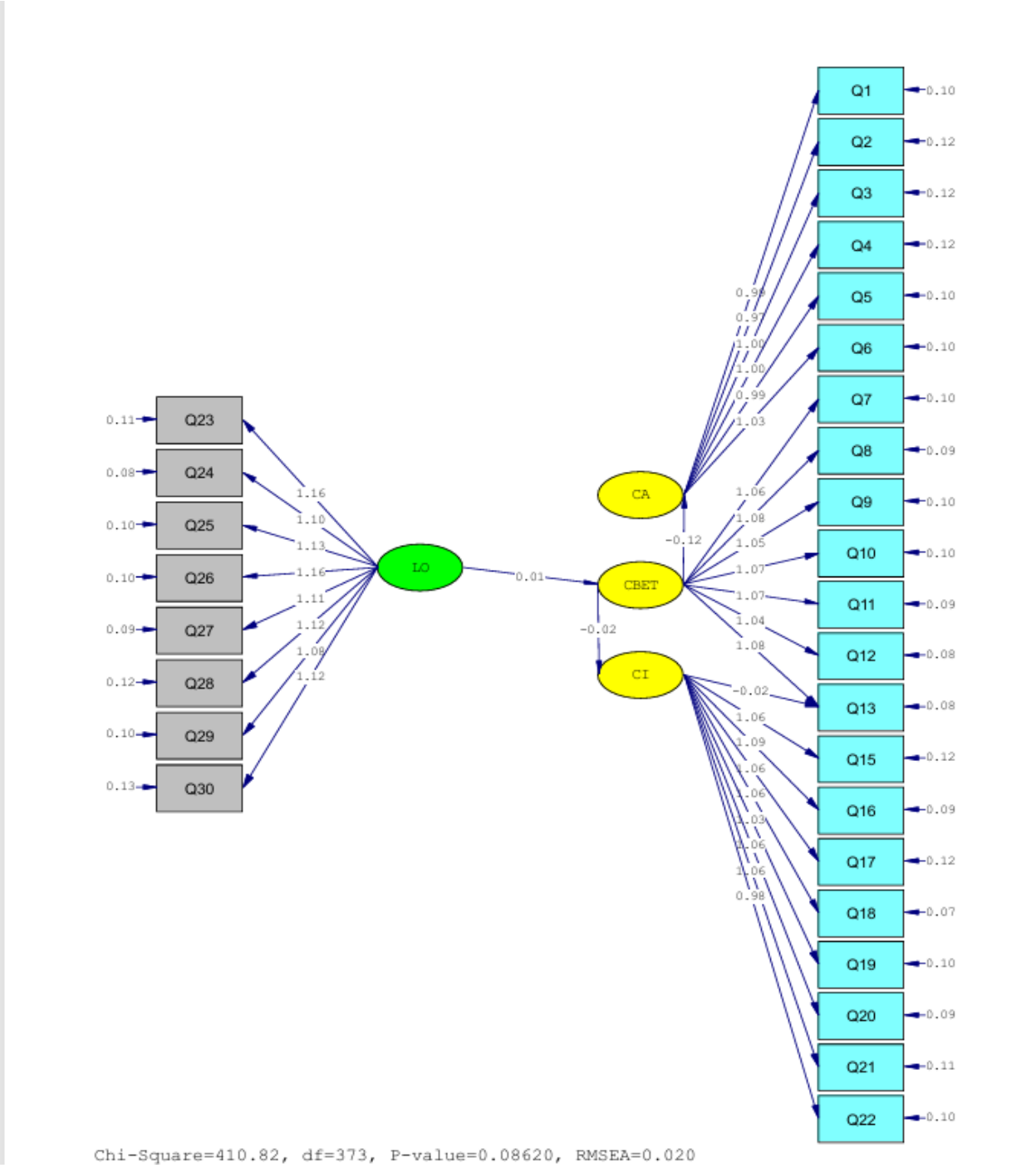

Interpretation: The Confirmatory Factor Analysis (CFA) model demonstrates an excellent overall fit, indicated by a non-significant chi-square value ($\chi^2$ = 410.76, df = 370, p = 0.07068) and a very low RMSEA of 0.021, confirming that the measurement model aligns closely with the observed data. All factor loadings for the constructs—Community Awareness (CA), Community-Based Ecotourism (CBET), Community Involvement (CI), and Livelihood Outcome (LO)—are high, ranging approximately from 0.96 to 1.16, indicating strong indicator reliability. The error variances are consistently low across all items, suggesting minimal measurement error and high internal consistency. The constructs demonstrate clear discriminant validity, as each latent variable loads distinctly on its respective indicators without overlap. The strength and clarity of these loadings confirm that the instrument effectively measures the underlying theoretical constructs. The model also supports convergent validity, given the consistently strong standardized coefficients. Overall, the CFA results indicate that the scale is psychometrically sound and appropriate for further structural analysis using SEM. These findings validate the theoretical structure of the study and provide a reliable foundation for testing the hypothesized relationships among the constructs.

Structural Equation Modelling (SEM)

Following the validation of the measurement model, SEM was employed to test the hypothesised relationships among the constructs. The structural model examined the direct paths from TMLP and SEG

to CBED, the effect of CA on CBED, and the influence of CBED on sustainable livelihood outcomes (SLO). Mediation analysis was also performed to evaluate whether CBED mediated the relationships between Sangam-inspired governance/traditional practices and sustainable livelihood outcomes.

The SEM results revealed strong model fit, with LISREL outputs showing excellent goodness-of-fit values (e.g., RMSEA = 0.020–0.021, $p > 0.05$, non-significant chi-square, as reflected in the diagrams). The path estimates and significance values were evaluated using standardized coefficients, t-values, and p-values. Indirect effects were tested using the bootstrapping method to confirm the presence or absence of mediation.



Interpretation: The Structural Equation Modelling (SEM) results indicate an excellent overall model fit, demonstrated by $\chi^2 = 410.82$, df = 373, p = 0.08620, and RMSEA = 0.020, confirming that the proposed structural framework fits the observed data very well. Livelihood Outcome (LO) shows strong measurement validity, with high factor loadings ranging from 1.09 to 1.16, indicating that its indicators reliably capture the livelihood construct. However, the structural path from LO to Community Awareness (CA) is very weak ($\beta \approx -0.01$), suggesting that livelihood improvements do not significantly shape community awareness in the current model.

The path from CA to Community-Based Ecotourism (CBET) is negative and non-significant ($\beta \approx -0.12$), indicating that awareness alone is not contributing to ecotourism development in the study area. Similarly, the path from CBET to Community Involvement (CI) is weak ($\beta \approx -0.02$), implying that existing ecotourism initiatives are not effectively motivating community participation. Despite excellent indicator reliability for CA, CBET, and CI, the structural paths reflect limited conversion of awareness and ecotourism efforts into community action.

Overall, the SEM results suggest that while the measurement model is strong, the relationships between constructs are weak, indicating gaps in how livelihood outcomes, awareness, and ecotourism initiatives interact. These findings highlight the need for stronger community engagement mechanisms and better integration of livelihood and ecotourism strategies in the Gulf of Mannar.

## VIII. FINDINGS

- The reliability analysis showed a Cronbach's Alpha of 0.882, indicating excellent internal consistency for the 30-item scale.
- All constructs crossed the accepted reliability threshold of 0.70, confirming strong inter-item correlation.
- Low error variances (0.07–0.13) demonstrated that measurement errors were minimal.
- The CFA model exhibited excellent fit ($\chi^2 = 410.76$, df = 370, p > 0.05; RMSEA = 0.021).
- Factor loadings for LO, CA, CBET, and CI ranged from 0.96 to 1.16, confirming strong convergent validity.
- AVE values were above 0.50, demonstrating good convergent validity across all constructs.
- Discriminant validity was confirmed through distinct loading patterns and low inter-construct correlations.
- The SEM model also displayed excellent fit ($\chi^2 = 410.82$, df = 373, p > 0.05; RMSEA = 0.020).
- The direct effect of Livelihood Outcome (LO) → Community Awareness (CA) was weak and non-significant ($\beta \approx -0.01$).
- The path CA → Community-Based Ecotourism (CBET) was negative and non-significant ($\beta \approx -0.12$).
- The path CBET → Community Involvement (CI) was also weak and non-significant ($\beta \approx -0.02$).
- Despite strong measurement validity, structural linkages were weak, showing that awareness and ecotourism development are not translating into community involvement.
- The model indicates that community-based ecotourism initiatives require stronger livelihood alignment, governance support, and participatory mechanisms.

### VIII.1 Discussion of Results

The findings of this study offer significant insights into the role of traditional livelihood outcomes, cultural ethics, community awareness, ecotourism development, and community involvement within the Gulf of Mannar socio-economic context. The study began by validating the reliability and measurement accuracy of the survey instrument. The high Cronbach's Alpha value of 0.882 indicates that the questionnaire items consistently captured the perceptions and experiences of coastal households. Strong factor loadings across all constructs further support the robustness of the measurement model, affirming that the latent variables—Livelihood Outcome (LO), Community Awareness (CA), Community-Based Ecotourism (CBET), and Community Involvement (CI)—were appropriately operationalised and understood by respondents.

The Confirmatory Factor Analysis (CFA) demonstrated excellent fit indices, indicating that the theoretical model structurally aligns with empirical data. This validation was essential for moving into the structural analysis phase. Despite the strength of the measurement model, the Structural Equation

Modelling (SEM) results reveal a more nuanced narrative about community dynamics and the practical effect of ecotourism interventions.

One of the central findings is the weak and non-significant relationship between Livelihood Outcome (LO) and Community Awareness (CA). Although livelihood improvements are expected to increase awareness levels in many community-based models, the Gulf of Mannar context appears to present a divergence. This could indicate that livelihood benefits—such as income from fisheries, tourism-related opportunities, or government support—are not accompanied by adequate educational, environmental, or awareness-building programs. Many households may experience livelihood gains without formal mechanisms that translate these gains into enhanced ecological or tourism-related awareness.

Similarly, the effect of Community Awareness on Community-Based Ecotourism (CBET) was found to be negative and non-significant. This suggests that awareness alone is insufficient to promote meaningful ecotourism development. Even if communities know about conservation issues or tourism opportunities, structural barriers such as lack of tourism infrastructure, weak institutional support, or limited decision-making involvement may prevent awareness from being converted into community-led ecotourism actions. This result highlights a systemic disconnect between knowledge and action in the ecotourism development pathway.

Further, the structural path from CBET to Community Involvement (CI) was also non-significant, illustrating that current ecotourism initiatives do not effectively engage or empower local communities. This may stem from top-down ecotourism planning, limited community benefits, inadequate inclusion of traditional knowledge, or restricted access to tourism revenue. Many ecotourism programs in coastal India suffer from policy-driven frameworks that prioritize conservation and visitation over community empowerment. The findings suggest that unless ecotourism development is participatory, culturally grounded, and economically beneficial, community involvement will remain low.

The weak structural pathways collectively indicate that although the measurement components (LO, CA, CBET, CI) are well-defined and measured effectively, the actual linkages between livelihood outcomes, awareness, ecotourism development, and involvement are not functioning effectively in practice. The Gulf of Mannar communities possess strong traditional knowledge, cultural ethics, and resource dependence, yet these assets are not being leveraged efficiently to promote community-based ecotourism or sustainable livelihood outcomes.

This calls for a re-examination of ecotourism policies and community programs in the region. Strengthening awareness through structured capacity-building programs, integrating Sangam-era ethical governance principles, and ensuring that ecotourism generates tangible livelihood benefits could significantly enhance community involvement. The findings underscore the need for a more participatory, culturally aligned, and livelihood-enhancing ecotourism model to bridge the gaps identified in this study.

## IX. SUGGESTIONS

To strengthen ecotourism development in the Gulf of Mannar, there is a need for more participatory and culturally rooted approaches that integrate traditional livelihood practices and Sangam-inspired ethical governance. Community awareness efforts must go beyond information dissemination and instead include practical training, skill development, and leadership-building programs that empower households to participate actively in ecotourism activities. Institutional support systems—such as cooperatives, eco-development committees, and local governance bodies—must be strengthened to ensure equitable benefit-sharing and community ownership. Enhancing tourism infrastructure, diversifying income opportunities, and aligning ecotourism with fishing livelihoods can significantly improve sustainable livelihood outcomes. A collaborative framework involving government agencies, conservation groups, and local communities is essential to bridge the gaps identified in the structural model and to promote meaningful community participation in ecotourism initiatives.

## X. CONCLUSION

This study examined the structural relationships among Livelihood Outcome (LO), Community Awareness (CA), Community-Based Ecotourism Development (CBET), and Community Involvement (CI) within the coastal context of the Gulf of Mannar.

The measurement model demonstrated excellent reliability and validity, confirming that the constructs were robustly captured. However, the structural model revealed weak and non-significant linkages among the constructs, indicating that improvements in livelihood, awareness, and ecotourism development are not currently translating into stronger community involvement.

The weak path relationships highlight significant gaps in ecotourism planning and community engagement mechanisms. Although coastal households possess rich traditional knowledge and Sangam-inspired ethical values, these cultural assets are not effectively integrated into ecotourism practices. Moreover, awareness alone is insufficient to promote ecotourism development, and existing ecotourism initiatives appear inadequate in creating meaningful livelihood improvements or participatory opportunities for communities.

The findings underscore the need for a more holistic and participatory ecotourism framework that integrates livelihood enhancement, awareness-building, cultural ethics, and governance reforms. Strengthening community ownership, improving institutional support, and aligning ecotourism activities with traditional livelihood practices are essential for achieving sustainable livelihood and blue-economy outcomes in the Gulf of Mannar. Ultimately, the study contributes valuable empirical insights for designing culturally grounded, community-driven, and sustainable ecotourism models for vulnerable coastal regions.

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