

The Role of Social Media, Tourism Facilities, and Blue Economy in Promoting Sustainable Marine Tourism: A Case Study of Benan Island Village

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Abstract. Integrating sustainable practices in marine tourism has become increasingly essential in promoting environmental stewardship and long-term economic benefits. This study explores how social media, tourism facilities, and the blue economy collectively influence visits to Benan Island Village, Indonesia. By employing a structural equation model (SEM), the research examines both direct and indirect relationships between variables. Results indicate that social media and tourism facilities significantly affect tourist visits, both directly and indirectly, through the mediating role of the blue economy. The findings suggest that promoting sustainable tourism practices, aligned with blue economy principles, not only attracts more visitors but also enhances their experience, fostering repeat visits. This study contributes to the growing body of knowledge on digital marketing strategies for sustainable tourism, offering practical implications for policymakers and stakeholders aiming to balance economic growth with environmental preservation in marine destinations.

1 Introduction

The development of technology using New Media has had a wide-ranging impact on all aspects of social development, resulting in the realization of a new era, namely that 'New Media' is a product of technology under the background of the present and future eras [1]. The growing internet is opening up, and the marketing strategies of traditional media and 'new media' have differences. One of the marketing techniques used in the tourist sector, whether digitalization in the travel and hospitality sector, is the quick growth of the digital share [2]. Few researchers in marketing face data shortages when investigating consumer insights. Available options are largely limited to expensive mass surveys, inefficient focus groups, and scarce, expensive, irregular, and infrequent secondary data responses [3]. Digital marketing has become a force and an opportunity to change the world of marketing and sales, including consumer behavior. The benefit of digital marketing is that it puts its products and services online easily so that businesses can attract potential. Customers receive feedback in an easy-to-access manner [4].

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Indonesia currently has 202.6 million internet users, as demand and purchasing power continue to increase. The increasing per capita income of the people in this country also affects the progress of digital business. Maritime tourism and beaches The marine environment and tourism are interconnected because they are related. Maritime tourism mostly occurs in the ocean, for example, sailing, while beach tourism occurs in coastal areas and includes beach-based tourism such as beach recreation activities, swimming, sunbathing, beach sports, and there are also resorts [5]. Decision-making in marine socio-ecological systems must focus on mutual benefits to ensure the ocean contributes to sustainable maritime development goals [6]. Tourism businesses understand how to appropriately manage perceptions of local brand authenticity and take culture into account when designing promotions for tourist destinations, to increase engagement with tourist sites [7].

Marine tourism is crucial for archipelagic countries like Indonesia. Indonesia's diverse ecosystems and coastal beauty offer great potential for tourism, driving economic growth, job creation, and community support. Funding assistance and training in operational management to manage marine tourism, the communities involved need to be further empowered, be it homestays with local wisdom, locations, and facilities aimed at maintaining ecotourism sustainability [8]. However, the increase in marine resources due to mass tourism has fuelled concerns about sustainability [9]. Sustainable tourism development is primarily about saving ecosystems, including coral reefs and fisheries [10]. The "blue economy" promotes sustainable tourism by focusing on sustainable use of marine resources, economic growth, job creation, and ecosystem health [11]. This approach has ensured that economic development must go hand in hand with environmental conservation, as it is imperative to maintain the sustainability of marine tourism destinations in the long term [12].

Digital marketing, especially social media, has significantly impacted tourism by reaching more travelers, influencing their decisions, and fostering engagement. [13]. Tourism facilities like accommodation, transportation, and services play a crucial role in attracting and satisfying tourists, promoting repeat visits. Quality infrastructure enhances visitor experiences and supports environmental conservation [14]. Other studies show that better facilities and infrastructure can complement digital marketing efforts, ensuring that the traveler experience promoted online will be the same as the actual traveler experience [15]. This study aims to understand how social media, tourism facilities, and the blue economy influence tourist visits to Benan Island Village. This knowledge will help create a sustainable marine tourism plan that balances economic growth and environmental protection.

1.1 Problem Statement

Benan Island Village, known as "Little Bali," faces challenges in promoting sustainable marine tourism due to environmental risks and local management issues. Despite its potential, the village lacks integrated digital marketing and infrastructure, hindering sustainable development. This research aims to create a model that integrates sustainability with tourism marketing strategies to address these challenges and ensure long-term environmental and economic benefits.

1.2 Research Questions

The following important research topics are addressed in this study: (1) How can social media and tourism facilities influence travelers to visit? Social media sites have a significant impact on how tourists view and anticipate a place, which in turn affects their choices. Additionally, the happiness and intention of visitors to come are strongly correlated with the availability of tourism amenities including lodging, transportation, and

services. Analyzing the direct correlation between social media, tourism infrastructure, and the volume of visitors to maritime tourism locations is the aim of this study in Benan Island Village. (2) What role does the blue economy play in promoting sustainable marine tourism? The blue economy concept focuses on increase in economic growth that can be achieved by utilizing sustainable natural resources, namely the sea. Ensuring the sustainability of marine ecosystems. This question explores and integrates the principles of the blue economy into one of the tourism strategies to promote sustainable marine tourism, encourage repeat visits, and ensure long-term tourism destination sustainability.

2 Literature Review

Social media has transformed the strategies of tourism destinations by enabling them to promote themselves, thereby increasing their visibility among both local and international audiences. Platforms such as Instagram, Facebook, and TikTok have emerged as essential tools for tourism promotion, utilizing visually engaging content and collaborations with influencers. The rise of digital storytelling through user-generated content (UGC) has also empowered travelers to share their experiences, further enhancing a destination's online presence. Recent studies emphasize that destinations utilizing social media effectively can achieve broader exposure, attract niche markets, and cultivate stronger brand loyalty [16]. By employing targeted social media campaigns across platforms such as Instagram, Facebook, WhatsApp, and TikTok, destinations can engage directly with tourists, influencing their perceptions and ultimately their travel decisions [17]. Tourism facilities, including accommodations, restaurants, and transport services, play a fundamental role in shaping a tourist's experience. Modern tourists expect high standards in terms of infrastructure, especially as travel preferences have evolved towards more experience-driven tourism. Well-maintained and easily accessible facilities can significantly enhance a destination's appeal and increase tourist satisfaction [18].

The sustainable blue economy focuses on using marine resources to improve regional economies, coastal communities, and marine ecosystems. It seeks a balance between economic development and ocean conservation, considering factors like climate change, technology, and limited knowledge. This concept has gained importance due to concerns about depleting marine resources. In tourism, the blue economy promotes eco-friendly practices that minimize environmental impact while benefiting regional populations and biodiversity [12]. The blue economy involves a variety of industries, including renewable energy, marine tourism, and fishing. It places a strong emphasis on the adoption of inclusive and sustainable practices that support long-term environmental management.

The use of sustainable marine resources in tourism marketing can attract environmentally conscious tourists and support long-term environmental conservation. This framework supports the development of marine tourism by encouraging practices that are both economically viable and ecologically sound, fostering resilience in coastal communities, and ensuring the conservation of marine biodiversity [11]. In the context of marine tourism, blue economy practices emphasize sustainable tourism initiatives, such as eco-friendly resorts, sustainable marine recreational activities, and the promotion of marine conservation efforts. Implementing these practices ensures that tourism activities do not contribute to the decline of coral reefs and more marine environments and fisheries, which are vital to the tourism appeal of coastal destinations [11]. Destinations like Benan Island, where marine biodiversity is a key attraction, can benefit significantly from adopting blue economy strategies to preserve their natural resources while enhancing the tourist experience. This is what should be promoted to the broader public regarding environmentally sustainable tourism, such as coral reef conservation initiatives, to align with the global movement towards responsible tourism. Recent research highlights the

importance of involving local communities in the implementation of blue economy practices. By providing training and employment in sustainable tourism initiatives, these practices help improve livelihoods and foster environmental stewardship among local populations [37]. Furthermore, integrating the blue economy into tourism marketing strategies can enhance the attractiveness of destinations to environmentally conscious travelers, leading to increased tourist loyalty and repeat visits [39]. Tourism marketing and sustainability are increasingly intertwined. Sustainable tourism marketing emphasizes eco-friendly practices and attracts eco-conscious travellers [19]. One of the most effective tools for promoting environmentally friendly tourism is social media. Social media networks are a useful tool for destinations to demonstrate their sustainability commitment and attract environmentally conscious tourists who are more likely to engage in sustainable practices [20]

Research on sustainable tourism promotion has grown significantly in recent years, driven by the increasing awareness of climate change and environmental degradation. Previous studies have explored how destinations can integrate sustainability into their marketing efforts by promoting eco-friendly practices, such as green certifications for hotels, sustainable transportation options, and local food sourcing. Destinations that actively market their sustainability efforts tend to perform better in terms of tourist satisfaction and loyalty, as travelers are increasingly seeking authentic, environmentally responsible experiences [21].

2.1 Theoretical Framework and Hypotheses Development

This study proposes a conceptual model based on a Structural Equation Modeling (SEM) approach to explore the relationships between social media, tourism facilities, the blue economy, and tourist visits. The model seeks to integrate these variables into a cohesive framework, highlighting the interactions and mediating roles that contribute to sustainable marine tourism, particularly in regions such as Benan Island Village.

2.2 Overview of the SEM Framework

The proposed conceptual model examines the direct and indirect relationships between social media, tourism facilities, the blue economy, and tourist visits. Social media is a crucial tool for promoting tourism, while quality tourism facilities and blue economy practices influence tourist satisfaction and visits. The model aims to understand how these factors interact to shape tourist perceptions.

3. Hypothesis

Here is a visual representation of the structural equation model (SEM) based on the proposed conceptual framework. It shows how "Social Media" and "Tourism Facilities" influence both "Tourist Visits" and the "Blue Economy," with some relationships being direct and others indirect.

Above all, the following hypotheses are developed.

Direct Hypotheses:

- H1: Social media promotion has a positive impact and significant effect on tourist visits.
- H2: Improved tourism facilities have a positive and significant effect on tourist visits.
- H3: The implementation of blue economy practices has a positive and significant effect on tourist visits.
- H4: Social media promotion positively affects the adoption of blue economy practices.
- H5: Improved tourism facilities positively influence the adoption of blue economy practices.

Mediation Hypotheses:

- H6: The blue economy mediates the relationship between social media promotion and tourist visits (red path).
- H7: The blue economy mediates the relationship between tourism facilities and tourist visits (green path).

These hypotheses reflect the expected direct and indirect relationships between social media, tourism facilities, blue economy practices, and tourist visits, providing a foundation for empirical testing through the SEM model.

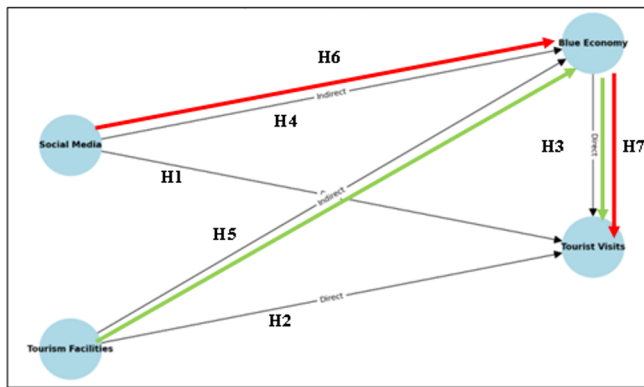


Fig. 1 Research Model

4 Research Methodology

This kind of study employs a quantitative methodology and hypothesis testing to explain. Tourists from both domestic and foreign countries who have visited Pulau Benan Village's maritime tourism sites served as the study's subjects. Information comes from visitors via Facebook, Twitter, Google, YouTube, Flickr, LinkedIn, Instagram, Tumblr, and Foursquare. There are 150 respondents in all, including local and foreign visitors who have been to Pulau Benan Village's maritime tourism areas and the data analysis method used was SEM-PLS

This study applies structural equation modeling (SEM), a quantitative research design to investigate the relationships between social media, tourism facilities, blue economy practices, and tourist visits. SEM is widely used in tourism research as it provides robust insights into causal relationships and mediating effects, making it suitable for this study's objective of understanding the impact of these variables on sustainable marine tourism.

The model proposed in this study incorporates latent constructs for each of the key variables—social media, tourism facilities, and the blue economy—based on multi-item scales validated in previous research. These constructs will be measured using reflective indicators, with data collected through a Likert-scale survey. Evaluate the model using PLS Smart by looking at the outer model. Outer model. There are two indicators, namely reflective and formative indicators. The individual reflection measure will be high if the correlation is 7 but suggests a loading factor value ranging from > 5 to 6.

5 Results

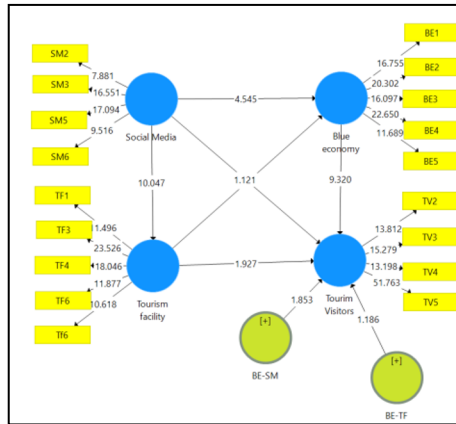


Fig. 1 Structural Equation Model (SEM) – Tourism, Framework

5.1 Outer Loading Analysis

The outer loading analysis in the context of an SEM-PLS model, illustrating the connections between the corresponding latent components and the observable indicators. Let's review the results for each key section:

1. Blue Economy (BE) Indicators

The outer loadings for the five indicators related to the Blue Economy range from 0.782 to 0.860, which suggests that these indicators have strong correlations with the Blue Economy latent variable. All t-values for these indicators are significantly high, with the lowest at 11.689 for BE5 and the highest at 22.650 for BE4, indicating that all the loadings are statistically significant. The p-values for all indicators are 0.000, further confirming the significance of the relationships between the indicators and the latent variable.

2. Social Media (SM) Indicators

The loadings for the social media indicators range from 0.705 to 0.979, with SM6 having the lowest loading at 0.727, indicating a weaker but still acceptable relationship to the latent variable. T-statistics for the Social Media indicators range from 7.762 to 17.094, showing that all outer loadings are statistically significant. As with the Blue Economy indicators, the p-values are consistently 0.000, indicating that all loadings are significant.

3. Tourism Facilities (TF) Indicators

The outer loadings for the Tourism Facilities indicators range from 0.747 to 0.808. All values are comfortably above the common threshold of 0.7, suggesting that these indicators reliably measure the latent construct of tourism facilities. T-statistics range from 11.496 to 23.526, with all values being well above the threshold of 1.96 (for a significance level of 5%), indicating strong statistical significance. The p-values are all 0.000, confirming that the relationships between the indicators and the latent variable are highly significant.

4. Tourist Visit (TV) Indicators

The outer loadings for the Tourist Visit indicators are between 0.740 and 0.901, with TV5 showing the strongest loading at 0.901, indicating a very strong relationship with the latent construct. The T-statistics are similarly strong, ranging from 13.198 to 51.763. The extremely high t-statistic for TV5 further supports the robustness of this indicator. Once again, all p-values are 0.000, indicating strong statistical significance across all indicators for tourist visits.

All indicators have strong loadings (greater than 0.7), indicating reliability. T-statistics and p-values confirm significant relationships between indicators and latent variables. This suggests a robust measurement model, suitable for further analysis.

5.2 Construct Reliability and Validity Analysis, rho A, Composite Reliability CR, Average Variance Extracted (AVE), f-Square

The table above presents the results of the Construct Reliability and Validity analysis for an SEM-PLS model. The key measures included are Cronbach's alpha, rho_A, composite reliability (CR), and average variance extracted (AVE). Here's a breakdown of the results. Cronbach's alpha is a traditional measure of internal consistency and reliability. In this table, all constructs have values well above the commonly accepted threshold of 0.7, except the perfect values of 1.000 for BE-SM and BE-TF, which may represent perfectly reliable constructs or fixed relationships. Constructs like Blue Economy (0.871) and Tourist Visit (0.815) show very high reliability, while Social Media (0.760) is also acceptable but relatively lower, indicating slightly lower internal consistency compared to the others.

rho_A is an improved reliability coefficient, with values generally reflecting a more accurate measure of reliability than Cronbach's Alpha. All constructs in this table have rho_A values between 0.776 and 1.000, indicating excellent reliability. The Tourist Visit (0.833) and Tourism Facilities (0.821) constructs show strong reliability, as do all others. The high rho_A values confirm that the constructs are reliable and internally consistent.

Composite Reliability is another measure of internal consistency, and in SEM-PLS, it is considered more appropriate than Cronbach's alpha because it does not assume equal indicator loadings. All the constructs have CR values above the threshold of 0.7, with the lowest being social media (0.846). Values above 0.8 are typically considered good, and constructs like Blue Economy (0.906) and Tourist Visit (0.879) show particularly high reliability. The values of 1.000 for BE-SM and BE-TF indicate that these constructs have perfect internal consistency.

The concept's capturing of the fluctuation in relation to the variation brought on by measurement inaccuracy is measured by AVE. A value of 0.5 or above indicates that the latent variable accounts for more than half of the variation in the indicators, which is regarded as a satisfactory degree of convergent validity. All constructs in the table have AVE values above 0.5, indicating good convergent validity. For example, Blue Economy (0.660) and Tourist Visit (0.646) have strong AVE values, meaning the indicators strongly represent their constructs. The construct Tourism Facilities (0.568), though slightly lower than others, still meets the minimum threshold of 0.5, indicating that the construct captures a sufficient amount of variance from its indicators.

Overall, the table indicates that the constructs in this SEM-PLS model exhibit strong reliability and validity: Cronbach's Alpha and rho_A show that the internal consistency of the constructs is solid, with all values well above the acceptable threshold. Composite Reliability (CR) confirms the constructs' reliability, displaying a significant level of internal consistency. The constructs have useful convergent validity, shown by Average Variance Extracted (AVE), which explains a significant amount of the variance in the indicators. Thus, the constructs are suitable for further analysis, and the measurement model is considered reliable and valid.

5.3 Review and Narration of f² (Effect Size) Analysis in SEM-PLS

The f-square (f²) analysis evaluates the effect size of exogenous (independent) variables on endogenous (dependent) variables in the SEM-PLS model. In a structural model, the values we get from data analysis will help us understand how strongly one latent

construct affects another. Just like a map, a structural model also depicts the relationships between various abstract concepts. These values will show how much a change in one concept will cause a change in another. They are like directions that show how close the relationship is between two abstract concepts in our model. The larger the value, the stronger the influence of one concept. The values help us understand how strongly one latent construct influences another in the structural model. Here's a breakdown of the results:

1. BE-SM and BE-TF on Tourist Visit

BE-SM has a small effect on Tourist Visits with an f^2 value of 0.045. This means that while there is a relationship, the effect size is relatively small and not a dominant influence. Similarly, BE-TF has a small effect on Tourist Visit, with an f^2 value of 0.020, showing a minimal influence on this latent variable.

2. Blue Economy

The Blue Economy shows a very large effect size on its dependent variable (likely another construct within the model) with an f^2 value of 1.332. This indicates that the Blue Economy plays a critical role and has a dominant influence on this variable. Such a high f^2 value suggests that the Blue Economy construct is crucial to explaining the variance in its dependent variable.

3. Social Media

Social Media has a moderate effect on the Blue Economy with an f^2 value of 0.172, meaning that it has a meaningful and notable influence on the Blue Economy. However, Social Media has a negligible effect on Tourist Visit with an f^2 value of 0.018, which indicates that its impact on this variable is almost insignificant. Interestingly, Social Media has a moderate effect size on Tourism Facilities with an f^2 value of 0.616, suggesting that it is an important influencer for this variable.

4. Tourist Visit and Tourism Facilities

Tourist Visit has minimal effects on Tourism Facilities, with an f^2 value of 0.037, indicating a very small effect. Conversely, Tourism Facilities also have a small impact on Tourist Visit, with an f^2 value of 0.042, showing that their mutual influence is quite limited.

5.4 General Interpretation

Large Effect ($f^2 > 0.35$): The Blue Economy (1.332) has a very large effect on its dependent construct, making it the most influential variable in the model. Moderate Effect ($0.15 < f^2 < 0.35$): Social Media has a moderate influence on both the Blue Economy (0.172) and Tourism Facilities (0.616), highlighting its role as an important factor in these constructs. Small or Negligible Effects ($f^2 < 0.15$): Constructs like BE-SM, BE-TF, and Tourist Visit exhibit small or negligible effects on their respective dependent variables, meaning their influence in these relationships is relatively weak.

This f^2 analysis helps identify which relationships in the SEM-PLS model have strong, moderate, or weak influences. The Blue Economy is a dominant factor, with Social Media playing an important but secondary role in influencing other constructs. Relationships involving Tourist Visit, Tourism Facilities, BE-SM, and BE-TF are of lesser significance in this model, as indicated by their small effect sizes. This information is critical for determining the focus areas in refining the model, as constructs with large or moderate f^2 values should be prioritized due to their greater explanatory power.

The table above provides the R Square (R^2) and R Square Adjusted values for three latent constructs: Blue Economy, Tourist Visit, and Tourism Facilities. These values indicate how much variance in each endogenous (dependent) construct is explained by its exogenous (independent) constructs. Here's a detailed review:

1. Blue Economy ($R^2 = 0.340$, R^2 Adjusted = 0.326)

The R^2 value of 0.340 means that 34% of the variance in the Blue Economy construct is explained by its predictors. This indicates a moderate level of predictive accuracy. The R^2 Adjusted value of 0.326 accounts for the model's total number of predictors, marginally lowering the R^2 value. This means that although there is a slight difference between the researcher's conjecture and reality, the difference is not very large and does not significantly change the author's main conclusion. Overall, the Blue Economy construct has a moderate level of predictability based on its predictors, meaning there may still be some unexplained variance that could be accounted for by additional factors.

2. Tourist Visit ($R^2 = 0.686$, R^2 Adjusted = 0.668)

The R^2 value of 0.686 indicates that 68.6% of the variance in Tourist Visit is explained by its predictors, which suggests a high level of predictive power. The R^2 Adjusted value of 0.668 is slightly lower but still strong, indicating that the model's predictability is robust even after adjusting for the number of predictors. This high R^2 suggests that the exogenous variables in the model effectively explain most of the variance in Tourist Visit, making this a well-predicted construct.

3. Tourism Facilities ($R^2 = 0.381$, R^2 Adjusted = 0.375)

The R^2 value of 0.381 suggests that 38.1% of the variance in Tourism Facilities is explained by its predictors, indicating a moderate level of predictive accuracy. The R^2 Adjusted value of 0.375 is slightly lower but very close to the original R^2 , showing that the model remains reliable even after accounting for the number of predictors. This value suggests that while the predictors provide some explanation for the variance in Tourism Facilities, there is still a considerable amount of unexplained variance, meaning that additional predictors could improve the model's predictive power.

5.5 Overall Interpretation

Tourist Visit has the strongest predictive power, with almost 70% of its variance explained by the model's independent variables. This suggests a robust and well-fitting model for this construct. Both Blue Economy and Tourism Facilities show moderate predictive power, with around 34% and 38% of the variance explained, respectively. While the model explains a fair amount of variance, there is room for improvement by potentially incorporating additional variables or refining the model. The adjusted R^2 values are close to the R^2 values for all constructs, indicating that the model's explanatory power is not significantly affected by the number of predictors, and the model is generally stable.

The R^2 values suggest that the model has strong predictive capabilities for Tourist Visit, while Blue Economy and Tourism Facilities show moderate predictability. The model performs well overall but could benefit from further refinement to improve the explained variance, especially for the Blue Economy and Tourism Facilities constructs.

6 Discussion

According to the results of the SEM-PLS research, this part must include a thorough examination of how social media, tourism attractions, and the blue economy interact and affect tourists' travel behavior:

- **Social Media:** Social media is crucial for promoting tourism through digital storytelling and word-of-mouth. By using popular platforms like Facebook, WhatsApp, TikTok, and Instagram, and collaborating with local influencers, destinations like Pulau Benan can effectively showcase their marine biodiversity and attract tourists
- **Tourism Facilities:** Improved tourism infrastructure and sustainable practices will enhance visitor satisfaction, leading to more repeat visits and overall tourist arrivals.
- **Blue Economy:** The blue economy, which focuses on sustainable practices, has a significant positive impact on tourist satisfaction and repeat visits, as shown by the

analysis. This highlights the importance of sustainability efforts in achieving both economic and environmental benefits.

7 Conclusion

The government, businesses, and communities are working together to promote sustainable tourism. The government is providing support and incentives, businesses are developing eco-friendly practices, and communities are actively participating in conservation efforts. The research findings can be used to develop more sustainable tourism practices. This includes community-based tourism, eco-friendly technology, and partnerships with local communities. Additionally, the research can help improve tourism products, strengthen partnerships, raise community awareness, and inform government policies. Research has the potential for further development of theories related to sustainable marketing, the blue economy, and sustainable tourism. It can identify key factors, create new models, and provide valuable insights for practical application. The research will add to the existing database on the blue economy in marine tourism, providing a valuable resource for future studies. It will also contribute to the development of better research methods for investigating sustainable tourism. Overall, this research is expected to make a significant contribution to promoting more environmentally friendly tourism practices.

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