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Multi-Stakeholder Coordination in Environmental Management at the Marble Mountains Scenic Area, Da Nang City, Vietnam

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ABSTRACT

This study delves into the coordination among stakeholders in environmental management at the Marble Mountains (Vietnam)—a heritage site facing intense pressure from urbanization and tourism development. The research clearly identifies a disconnect between the awareness and actions of tourists and local communities and establishes an organic link between livelihood issues and the conservation responsibilities of travel businesses. Notably, the study points out that the current coordination mechanism remains largely formal. Current environmental protection efforts primarily operate according to a hierarchical administrative structure between the heritage site management board, local authorities, and relevant departments. This approach reveals gaps such as: overlapping and fragmented responsibilities leading to a situation where responses to environmental incidents are either shirked or only handled locally and piecemeal; The voices of the community and households involved in the stone carving craft village are still not being given due importance; they are placed in the position of being managed rather than being co-managers with vested interests in the heritage. Coordination agreements are often merely symbolic, lacking sufficiently strong sanctions to bind the parties to legal responsibility. Based on this, the study proposes a model of “Shared responsibility–Linked benefits”. This represents a groundbreaking shift in thinking from unilateral administrative management to a multi-stakeholder coordination mechanism, aiming to transform environmental management from an imposed obligation into an inherent benefit, creating momentum for the sustainable development of the Scenic Area.

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ARTICLE INFO

Received: 24 April 2026 | Revised: 22 May 2026 | Accepted: 28 May 2026 | Published Online: 31 July 2026
DOI: <https://doi.org/10.30564/re.v8i4.13452>

CITATION

Tuong, N.T., Thong, D.T., Ha, N.T., 2026. Multi-Stakeholder Coordination in Environmental Management at the Marble Mountains Scenic Area, Da Nang City, Vietnam. *Research in Ecology*. 8(4): 173–199. DOI: <https://doi.org/10.30564/re.v8i4.13452>

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Keywords: Environmental Management; Multi-Stakeholder Coordination; Scenic Area; Sustainable Tourism; Shared Responsibility

1. Introduction

The Marble Mountains are not only a Special National Monument of Vietnam ^[1] (**Figure 1**) but also possess the World Documentary Heritage site of the Marble Mountains ^[2] and the Quan The Am Festival, recognized as a National Intangible Cultural Heritage ^[3], along with the over 400-year-old Non Nuoc stone carving village. However, the explosion of mass tourism is creating tremendous

pressure on the ecosystem and spiritual space of the area. Environmental management at a “living heritage” like the Marble Mountains cannot rely solely on unilateral administrative orders from the State but requires the joint efforts of all stakeholders directly exploiting and benefiting from the heritage. Researching a modern governance model where stakeholders share responsibility is key to preserving the heritage’s value in the context of rapid urbanization in Da Nang city.

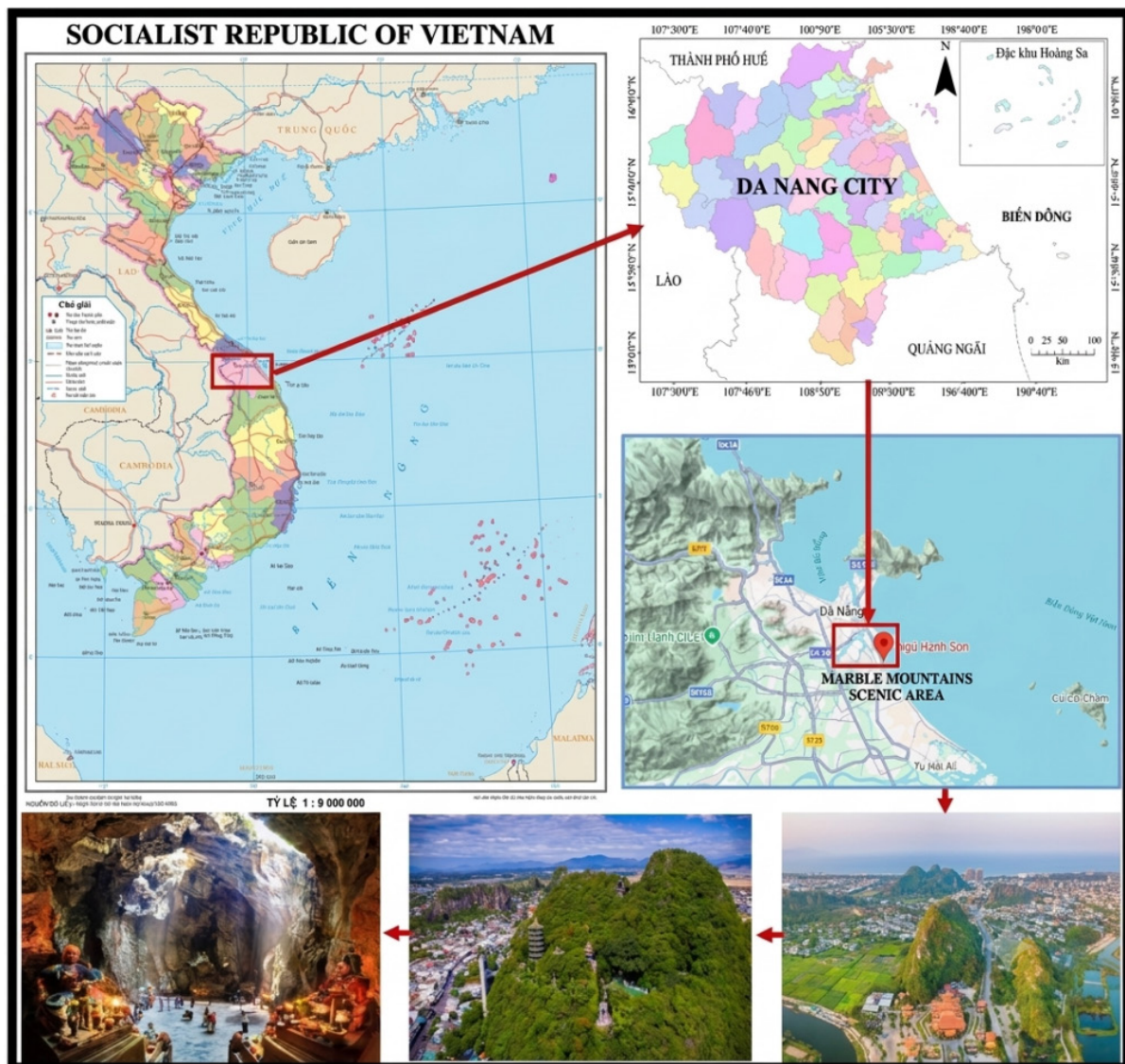


Figure 1. Location of the study area (Marble Mountains scenic area, Da Nang city, Vietnam).

In the context of many changes, such as (1) Changes in the legal framework, the 2020 Environmental Protection Law and the 2024 Cultural Heritage Law (amended) have emphasized the role of the community and stakeholders. Specifying these regulations in a unique destination like the Marble Mountains is an urgent requirement to synchronize policies; (2) Increasing conflicts of interest, a large “gap” between the commitment and implementation of tourism businesses, and a pragmatic mindset in conservation among local communities. Without a clear coordination mechanism, these conflicts will lead to irreversible landscape degradation; (3) Pressure from green tourism, after the COVID-19 pandemic, tourists’ tastes have shifted towards responsible tourism, the Marble Mountains need a boost in infrastructure and a multi-stakeholder monitoring mechanism to meet the standards of an international heritage destination; (4) With the increase in tourists over the years, Marble Mountains scenic area recorded an impressive breakthrough in the number of visitors in the period 2023–2025. Specifically, from 1,419,121 visitors in 2023^[4], the scenic area attracted 1,574,428 visitors in 2024^[5], especially 2,180,112 visitors in 2025^[6]. With a growth rate of tourists in the period 2023–2024 of 10.94% and in the period 2024–2025 of 38.47%. Notably, the international tourist segment accounts for a large proportion and is experiencing strong growth, affirming the position of the Marble Mountains as a top destination for foreign tourists visiting Da Nang city. The rapid increase in visitor numbers (over 50% in just two years) poses serious challenges to environmental protection at the Marble Mountains, including solid waste management, microclimate changes within the caves, pressure on infrastructure and geology, noise pollution, and air emissions.

The aim is to systematize the theoretical framework of multilateral governance and the “interaction quadrilateral” model in heritage environmental management; analyze and evaluate the current state of coordination mechanisms between the management board–tourism businesses–local communities–tourists at the Marble Mountains scenic area; identify “bottlenecks” and limitations in environmental protection coordination. From there, propose a “Shared responsibility–Linked benefits” coordination model along with specific technical and policy solutions to optimize the monitoring and sustainable conservation cycle of the scenic area.

2. Study Overview

The theoretical basis for stakeholder coordination stems from Freeman’s stakeholder theory (2015)^[7], which emphasizes that the success of any organization or project depends on managing the relationships between different interest groups. In the field of tourism and conservation, Bramwell et al. (2000)^[8] expanded this theory by asserting that destination sustainability is inseparable from compromise and cooperation. Multistakeholder coordination is considered an essential tool for addressing complex environmental problems (wicked problems) that a single entity lacks the resources or authority to handle. Following this approach, Ansell and Gash (2008)^[9] established the collaborative governance model. This model marks a significant shift in the role of state agencies and heritage management boards: from a position of unilateral command to a role of facilitator, facilitating direct participation of the private sector and communities in the decision-making process. The role of local communities is considered “key” in protecting the heritage environment. Nicholas and Thapa (2010)^[10] pointed out that the attitudes and support of indigenous people determine the effectiveness of conservation strategies. However, the shift from a top-down management model to participatory management faces many structural and capacity barriers, as demonstrated by the empirical study of Aas et al. (2005)^[11] in Luang Prabang (Laos). To overcome the formality in participation, Waligo et al. (2013)^[12] proposed a governance framework focused on genuinely engaging stakeholders, ensuring their voices carry weight in the final outcome. Recent studies have shifted the focus from purely administrative management to proactive and flexible engagement strategies. Wondirad et al. (2020)^[13] proposed a cohesive coordination framework to optimize both economic and environmental value simultaneously. In Vietnam, Holladay et al. (2020)^[14] concretized this model in Da Nang, analyzing the interaction and conflicts of interest between the government, businesses, and tourists in managing heritage resources. Currently, several studies focus on professionalism in coordination, such as Panagiotopoulou and Skoultos (2025)^[15] introducing a maturity scale to assess the effectiveness of multi-stakeholder coordination and practical design levers for destination governance. Mendoza and Talavera (2025)^[16] proposed a Hybrid Governance mod-

el, flexibly combining state control and market and community mechanisms, while Singh et al. (2026) ^[17] focused on a co-management model to balance community empowerment and tourism development. Despite theoretical advances, Urošević et al. (2026) ^[18] cautioned that sustainable heritage management remains an ongoing challenge. Potential conflicts of interest and the lack of effective coordination mechanisms remain gaps that need to be addressed in further research.

The interaction between stakeholders in the protection of heritage environments is studied in depth from two aspects, behavioral management and economic mechanisms:

- (1) On the part of tourists and businesses: Swarbrooke (1999) ^[19] and Byrd (2007) ^[20] pointed out that tourists' environmental awareness is directly affected by the quality of service and information from tourism businesses. These studies emphasize the role of "green marketing" in guiding tourist behavior at tourist sites;
- (2) On the part of the community and management board: Jamal and Getz (1995) ^[21] and Pedersen (2002) ^[22] in a United Nations Educational, Scientific and Cultural Organization (UNESCO) report analyzed community based heritage management models. The authors argued that when local communities are empowered and see the benefits of conservation, they become the most effective environmental monitoring force for both businesses and tourists.

The biggest research gap currently is the lack of a specific coordination mechanism to quantify the relationship between responsibility and benefits. Previous studies have mainly focused on surveying attitudes or building general theoretical frameworks, failing to clearly identify how to directly link socio-economic benefits with the environmental protection effectiveness of stakeholders. This forms the basis for proposing the "Shared responsibility-Linked benefits" model, aiming to transform coordination from a formal to a substantive approach through tangible benefits and cross-monitoring tools at heritage sites.

In recent decades, environmental management in Vietnam's heritage sites and scenic areas has shifted from a centralized administrative model to a network-based

governance model. Interdisciplinary studies involving environmental science, cultural management, and tourism economics all affirm that a multi-stakeholder coordination mechanism is crucial to ensuring the sustainability of heritage sites in the face of tourism development pressures. This research focuses on establishing a framework of responsibilities among four core stakeholders: the state (management board), tourism businesses, local communities and tourists; the effectiveness of coordination depends on the degree of alignment between the economic interests of businesses and their responsibility for heritage preservation; and emphasizes that clearly defined responsibilities in a multi-stakeholder governance model help minimize conflicts over resource use. When communities are empowered to monitor pollution, the effectiveness of environmental protection in scenic areas improves significantly due to its local relevance and connection to sustainable livelihoods. Multi-stakeholder coordination mechanisms in Vietnam are built on an increasingly legal framework:

- (1) Establish a mandatory inter-sectoral coordination mechanism, in which the Ministry of Natural Resources and Environment (now the Ministry of Agriculture and Environment) plays the role of technical supervision, while the ministries managing the relics directly implement it, especially giving maximum supervisory power to the community, turning people into subjects with the right to criticize projects affecting heritage. This coordination is operated based on the principle of information transparency and sharing of financial responsibility of tourism enterprises ^[23];
- (2) The model of coordination shifts to integrated governance, identifying the landscape environment as an inseparable fundamental element. This mechanism operates based on State coordination through planning, tourism enterprises implementing through contracts, and local communities monitoring through village regulations. The core objective is to link the responsibilities and interests of the parties to ensure sustainability between heritage conservation and tourism development ^[24];
- (3) Regulations on specific inter-sectoral coordination for heritage sites in Vietnam, transforming the management model from "single sectoral, command" to

“multi-sectoral, coordination” creating a legal basis for heritage management boards to have the power to coordinate relevant parties in protecting the heritage environment ^[25].

Overall, the reality shows that an “interaction quadrilateral” is gradually forming: (1) management board–tourism businesses: Interaction through legal and environmental fees; (2) tourism businesses–tourists: Interaction through green service experiences; (3) tourists–local community: Interaction through cultural exchange and behavior monitoring; (4) local community–management board: Interaction through livelihood rights and conservation. Despite many efforts, the current multi-stakeholder coordination mechanism still has limitations that have not been thoroughly addressed, such as a lack of uniformity among state management agencies in handling waste and wastewater issues at historical sites (overlapping authority) and local communities are often only mobilized in movement activities, lacking real power in decision-making processes. Currently, the link between the management board and tourism businesses is still primarily based on imposed administrative tools, while coordination with local communities remains largely formal and has not truly unleashed the supervisory role of local people. Furthermore, the pressure to increase tourist numbers by travel businesses is severely overloading the environmental treatment system. This is a clear manifestation of the conflict between short-term economic interests and the sustainable development goals of the heritage site.

The Marble Mountains are a special national monument of Vietnam, notable for its system of five majestic limestone mountains, a network of mystical caves, and endemic coastal vegetation in Da Nang city. It is a place where the essence of ancient culture and spirituality converges, preserving ancient temples and the system of rock inscriptions recognized by UNESCO as a World Documentary Heritage. The value of the site is also linked to the Non Nuoc stone carving village, creating a unique combination of natural beauty and intangible cultural heritage. With its significant tourism appeal, the Marble Mountains are not only a natural symbol but also an important socio-economic resource for the locality. Currently, the multi-stakeholder coordination mechanism for environmental protection at the Marble Mountains is limited by

the formality of commitments from tourism businesses, the pragmatism of the local community, the lack of infrastructure to support tourists and the insufficient coordination role of the site’s management board. Therefore, establishing a multi-stakeholder coordination mechanism (Management board–Tourism businesses–Local communities–Tourists) at the Marble Mountains scenic area is an urgent and essential requirement. This necessity stems from the following core reasons:

Addressing the complexity of the living heritage model: The Marble Mountains do not exist as a static monument but as a dynamic entity, where spiritual space, scenic value, and contemporary economic activities are closely intertwined. In this context, any unilateral management efforts from the State are unlikely to achieve optimal effectiveness without the consensus of two core elements: the local community, which directly preserve the cultural and spiritual essence of the heritage; and tourism businesses, which activate financial resources and exploit the market. A multi-stakeholder coordination mechanism is the solution to this complex problem, comprehensively encompassing strategic objectives ranging from geological conservation and environmental protection to tourism development.

Optimizing a seamless monitoring network: With limited personnel, the Management Board cannot be present in every corner of the scenic area 24/7. In this context, the local community acts as on-site guardians, directly detecting and preventing acts of damage to the heritage site on a daily basis. At the same time, tourists become the most objective monitors, promptly providing feedback on shortcomings in service quality and the environment. This multi-stakeholder coordination mechanism transforms the millions of eyes of locals and tourists into a voluntary, effective monitoring system without incurring additional operating costs for the management apparatus.

Balancing economic benefits and conservation responsibilities: The current management situation shows that the conflict between the profit-making goals of tourism businesses and the management board’s requirement to preserve the original values remains a persistent problem. However, when a multi-stakeholder coordination mechanism is established, tourism businesses will deeply understand that protecting the environment is protecting

their long-term business capital; at the same time, local people will clearly see that their sustainable livelihoods depend entirely on the enduring existence of the Marble Mountains. This mechanism promotes a fundamental shift in mindset from a mindset of exploiting resources to a philosophy of symbiotic development with heritage.

Enhancing the capacity for response and carrying capacity of the heritage site: Pressure from mass tourism trends is directly threatening the environmental carrying capacity of the Marble Mountains. In this context, a multi-stakeholder coordination mechanism plays a crucial role in optimizing the tourist flow plan through proactive regulation by travel businesses. Simultaneously, this model helps activate the immediate environmental incident response process through a rapid response network of the local community, closely integrated with the technical support infrastructure system from the Management Board.

To optimize the effectiveness of heritage conservation in conjunction with sustainable tourism development, creating a synchronized coordination mechanism among stakeholders is an urgent requirement. Based on the new legal framework and local characteristics, a multi-stakeholder coordination model at the Marble Mountains is proposed based on the principle of “Shared responsibility–Linked benefits”, bringing together four core stakeholders: the Management Board, tourism businesses, the local community, and tourists. In this ecosystem, the Management Board plays a central coordinating role through technical support and on-site monitoring. This mechanism transforms businesses into green business partners, while activating the local community from a passive mindset to a self-governing force protecting livelihoods. Simultaneously, tourists become voluntary supervisors thanks to the support of modern technological infrastructure and a multilingual information system. It all operates as a closed loop, with economic benefits as the driving force, technical infrastructure as the tool, and multi-stakeholder cross-monitoring as the binding thread to sustainably preserve the Marble Mountains scenic area.

3. Research Approach

Secondary data collection and processing methods: The study collected objective statistical data on

tourist traffic and compiled periodic reports from the Management Board of the Marble Mountains scenic area and related professional documents. This evidence serves as the basis for a comprehensive assessment of the current state of natural and socio-cultural environmental protection at the destination. Simultaneously, the legal framework and site planning were reviewed in depth to compare and evaluate the compatibility of the actual technical infrastructure with current national standards. Finally, descriptive statistical tools and comparative methods were applied to process the data, thereby clarifying the core challenges in balancing tourism development goals with the sustainable protection of the ecosystem.

Field observation method: The research team conducted direct observations at the Marble Mountains scenic area to compare survey responses with the actual behavior of the stakeholders.

Primary data collection method: The study uses a quantitative survey method through direct questionnaires to collect data from stakeholders. The goal of this method is to identify the current state of governance, measure the correlation between awareness and action, and thereby identify “bottlenecks” in environmental protection work.

All target groups were surveyed using a questionnaire system with a 5-point Likert scale to quantify the assessments: Level 1: strongly disagree (average score: 0.0–1.0); Level 2: disagree (average score: 1.1–2.0); Level 3: neutral (average score: 2.1–3.0); Level 4: agree (average score: 3.1–4.0); Level 5: strongly agree (average score: 4.1–5.0).

- (1) Management staff group (5 samples): Focus on evaluating the capacity to manage and implement standards on environmental infrastructure, monument planning, waste management, and human resources;
- (2) Tourism business group (30 samples): Survey organizations and individuals on their understanding of regulations, implementation of responsibilities to reduce plastic waste, and coordination and commitment with the government;
- (3) Local community group (35 samples): Evaluate the role of voluntary monitoring, awareness of the con-

nection between the environment and economic livelihoods, and agreement on penalties;

- (4) Tourist group (400 samples): Analyzing responsible journeys through awareness, attitudes, actual sightseeing behavior, social behavior, and personal conservation commitments. To ensure representativeness, reliability, and statistical inference value for assessments of the current state of environmental management at a scenic area, the study determined the sample size based on actual visitor data. According to statistical reports, the total number of tourists visiting the scenic area in 2025 will reach 2,180,112 visitors ($N = 2,180,112$). Since the overall size of the text has been clearly defined, the study applies Taro Yamane's (1967) ^[26] sample size calculation formula to quantitative studies with large populations and clearly defined sizes:

$$n = \frac{N}{1 + N e^2}$$

In there:

n : Minimum sample size required for the study.

N : Population size of tourists in 2025 ($N = 2,180,112$).

e : Allowable margin of error in sampling. This study accepts a rate of error at the level of ± 0.05 (corresponding to a 95% confidence level, significance level $\alpha = 0.05$).

Substituting the numerical values into the formula, we get the specific calculation:

$$\begin{aligned} n &= \frac{2,180,112}{1 + 2,180,112 \times (0.05)^2} = \frac{2,180,112}{1 + 2,180,112 \times 0.0025} \\ &= \frac{2,180,112}{1 + 5,450.28} = \frac{2,180,112}{5,451.28} \approx 399.93 \end{aligned}$$

Thus, for a large population of 2,180,112 visitors, the calculation from the above formula shows that the minimum theoretical sample size required is 400 samples (rounded from 399.93). To account for risks arising during the field survey at the Marble Mountains (such as visitors filling out incomplete information, wet or torn questionnaires, or unserious responses leading to invalid questionnaires during data cleaning), the study decided to increase the number of questionnaires distributed by 12.5%. The total number of survey questionnaires expected to be distributed directly at the Marble Mountains was 450. After

screening and cleaning, the remaining questionnaires that met the requirements were 400.

The collected data was analyzed and processed: (1) Descriptive statistics (Calculating frequency, percentage and mean values to reflect the characteristics of the survey sample); (2) Likert scale analysis (Assessing the level of agreement of survey subjects through the average score value); (3) Presentation of results (Data is presented in the form of tables and charts to increase visual appeal and support the review and evaluation process).

4. Research Results

4.1. Current Status of Coordination Mechanisms in Environmental Protection at the Marble Mountains Scenic Area, Da Nang City

4.1.1. Management Board in Environmental Protection

In heritage conservation, the management board's leadership role is a decisive factor in balancing tourism development and maintaining the pristine state of the heritage site's ecosystem. At the Marble Mountains scenic area, this responsibility is concretized through efforts to implement standards for protecting the natural and socio cultural environment, aiming to create a professional and law abiding destination.

Environmental protection efforts at the Marble Mountains scenic area have achieved outstanding results with high consensus from the evaluators. Survey results show absolute agreement with environmental protection measures at the scenic area, with no dissenting opinions and a very high average score ranging from 4.4 to 5.0 (shown in **Table 1**).

The data is categorized into four distinct groups: the top priority is the location of a sanitary waste collection site (average score = 5.0); the core group includes waste/water infrastructure and behavior/emission management towards green transition (average score = 4.8); the group of regularly operated technical infrastructure and seasonal resource allocation (average score = 4.6); and the group requiring on-site adjustments is the location of waste collection equipment (average score = 4.4) (shown in **Figure 2**), due to the presence of 20% neutral opinions. Based on this

reality, the management model needs to focus on strictly maintaining the transfer station combined with reviewing and improving the aesthetics of the public waste bin system; simultaneously, institutionalizing core criteria into mandatory regulations for tourists and tourism businesses, alongside the stable operation of the wastewater treatment system and regular waste collection within 48 h.

The management of the toilet system shows the high appreciation of tourists for the organization and operation of the public sanitation system. The survey results on the toilet system at the historical site showed a very high level of consensus, with no dissenting or neutral opinions recorded, and an impressive average score across the entire table ranging from 4.6 to 5.0 (shown in **Table 2**).

Table 1. Levels of evaluation in waste management at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	The wastewater collection and treatment system within the scenic area is constructed and operated in accordance with current regulations	0.0	0.0	0.0	40.0	60.0	4.6
2	The treated wastewater meets the national technical standards for domestic wastewater	0.0	0.0	0.0	20.0	80.0	4.8
3	The minimum rate of solid waste collection and treatment must reach 80%	0.0	0.0	0.0	20.0	80.0	4.8
4	There are measures in place to sort solid waste at the source	0.0	0.0	0.0	20.0	80.0	4.8
5	The location of the solid waste transfer station must ensure hygiene, not affect the landscape, and comply with legal regulations	0.0	0.0	0.0	0.0	100	5.0
6	Solid waste storage and collection equipment is designed to blend seamlessly with the heritage site's landscape, featuring lids for convenient source sorting and appropriate sizes for storage duration	0.0	0.0	0.0	20.0	80.0	4.8
7	The locations for solid waste storage and collection equipment are arranged logically, without affecting the landscape, meeting usage needs, and are easily identifiable	0.0	0.0	20.0	20.0	60.0	4.4
8	There are plans to reroute traffic to reduce emissions in the area around the historical site	0.0	0.0	0.0	20.0	80.0	4.8
9	Parking areas and mooring points for all types of vehicles are sufficient to meet demand during peak hours	0.0	0.0	0.0	40.0	60.0	4.6
10	Smoking is strictly prohibited or restricted within the historical site, with bilingual (Vietnamese and English) signs accompanied by illustrative images	0.0	0.0	0.0	20.0	80.0	4.8
11	Plan and implement effective water conservation solutions	0.0	0.0	0.0	40.0	60.0	4.6
12	Household solid waste should not be stored for more than 2 days (48 h)	0.0	0.0	0.0	40.0	60.0	4.6
13	Plan and implement measures to reuse, recycle, and minimize the amount of solid waste sent to landfills	0.0	0.0	0.0	20.0	80.0	4.8

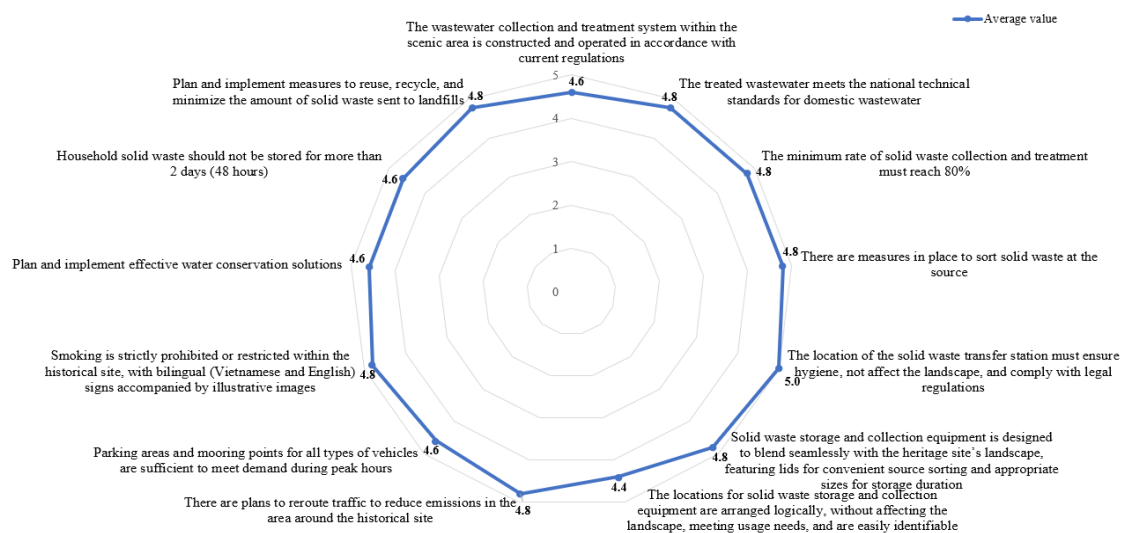


Figure 2. The levels of evaluation in waste management at the Marble Mountains scenic area.

Table 2. Levels of evaluation in the management of toilet facilities at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	The design and location of the restrooms should be in harmony with the landscape and characteristics of the historical site; easily recognizable, easily accessible, and secure	0.0	0.0	0.0	40.0	60.0	4.6
2	The restrooms are well equipped, in good working order, clean, well ventilated, and adequately lit	0.0	0.0	0.0	20.0	80.0	4.8
3	The restroom signage system includes clear and easily readable signs in Vietnamese, English or with illustrations	0.0	0.0	0.0	0.0	100	5.0
4	Plans are in place to arrange for or rent mobile or fixed toilets during peak periods to meet any sudden surge in demand	0.0	0.0	0.0	20.0	80.0	4.8
5	Sufficient and regular staff are assigned to maintain the restrooms to ensure they function properly	0.0	0.0	0.0	20.0	80.0	4.8

The data is clearly divided into three groups: the service highlight, receiving a perfect score, is the bilingual signage system and clear visual guidance (average score = 5.0); the core operational group, achieving outstanding satisfaction, includes clean facilities, proactive management during peak seasons, and consistently on-duty staff (average score = 4.8); and the design and location group, while the most aesthetically pleasing, still receives a high score

(average score = 4.6) due to the challenge of balancing the privacy of the heritage site with the accessibility of the services (shown in **Figure 3**). Based on this, the Management Board needs to leverage its strengths in providing guidance to other amenities, maintain a stable cleaning process and mobile service plan, and carefully survey visitor traffic flow to refine the location and design of new facilities to ensure they are both aesthetically pleasing and convenient.

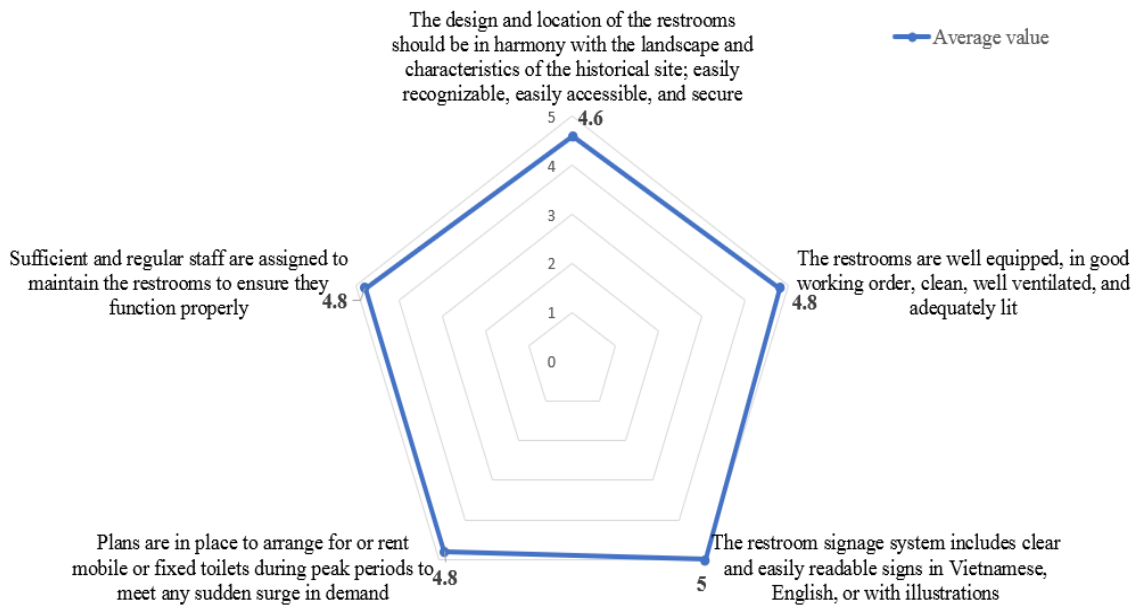


Figure 3. The levels of evaluation in the management of the toilet system at the Marble Mountains scenic area.

The preparation of resources for environmental protection at the scenic site has yielded very positive results, as evidenced by the optimization of both personnel and finances. The survey results on personnel, funding, and

social mobilization for environmental protection at the Marble Mountains scenic site show a very high level of consensus, with no dissenting or neutral opinions, and an average score ranging from 4.6 to 5.0 (shown in **Table 3**).

Table 3. Levels of evaluation in the allocation of human resources and funding for environmental protection work at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Assign dedicated or part-time staff with specialized knowledge to meet the needs of environmental protection management at the scenic site	0.0	0.0	0.0	0.0	100	5.0
2	Funding for environmental protection activities is allocated appropriately in accordance with state regulations and local specificities	0.0	0.0	0.0	0.0	100	5.0
3	The socialization of environmental protection involves the participation and support of relevant organizations and individuals, and adheres to the law	0.0	0.0	0.0	40.0	60.0	4.6

The data is clearly divided into two groups: the core foundation group, which must achieve a perfect score (average score = 5.0), includes the deployment of specialized/part-time personnel with expertise and ensuring reasonable and flexible state funding according to local characteristics; the group with slight differentiation, reaching a potential level that needs to be promoted (average score = 4.6, with 60% strongly agree and 40% agree), is the social mobilization work due to the complexity of multi-stakeholder coordination and ensuring legal compliance. Based on this reality, the management model at the Marble Mountains scenic area needs to focus on maintaining the internal framework through regular training and transparent use of state budget funds, while simultaneously unlocking social

mobilization resources through the establishment of a clear public-private partnership mechanism and the issuance of policies for rewarding and providing legitimate benefits to organizations and individuals contributing to green solutions.

The work of protecting the socio cultural environment at the scenic site has received exceptionally high consensus, 220 especially in management and ensuring security and order. The survey results on environmental and socio-cultural management, security and order, and community interaction at the Marble Mountains scenic site show ideal consensus with no dissenting or neutral opinions, with average scores ranging from 4.6 to 5.0 (shown in **Table 4**).

Table 4. Levels of assessment in socio-cultural environmental protection work at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Develop plans to prevent and stop phenomena that negatively impact the socio-cultural environment and security and order in the scenic area, and regularly inspect and handle violations in accordance with the law	0.0	0.0	0.0	0.0	100	5.0
2	Organize and arrange the system of shops and services for tourists in a reasonable and convenient manner, without affecting the scenic area	0.0	0.0	0.0	0.0	100	5.0
3	The site's operating regulations are established, publicly posted, and placed in an easily visible location	0.0	0.0	0.0	40.0	60.0	4.6
4	A system of signs and loudspeakers should be in place to guide tourists on environmental protection regulations clearly, regularly, and appropriately, without negatively impacting the scenic landscape	0.0	0.0	0.0	40.0	60.0	4.6
5	There is a system in place to promptly receive and process feedback from visitors, with a hotline and information publicly displayed and easily visible	0.0	0.0	0.0	20.0	80.0	4.8
6	Actively coordinate with local authorities, organizations, and individuals involved in environmental protection activities at scenic spots and promptly recommend handling violations	0.0	0.0	0.0	0.0	100	5.0
7	There are activities that share the benefits of exploiting the value of scenic spots with the local community, creating conditions for legitimate service businesses and making practical contributions to economic, cultural, and social development	0.0	0.0	0.0	0.0	100	5.0

The data is divided into three distinct priority levels: the core group, achieving a perfect score (average score = 5.0), affirms the vital role of security planning, orderly arrangement of stalls, coordinated handling of violations, and sharing economic benefits with the local community; the high service standard group (average score = 4.8) assesses the importance of a hotline system for receiving public feedback from tourists; and the guidance and regulations group, achieving the lowest but still very high

score (average score = 4.6), reveals the need for subtlety to avoid noise or visual pollution from loudspeakers and signs (shown in **Figure 4**). Based on this reality, the Management Board needs to promote a co-management model with local people, digitize feedback channels via QR codes for quick information processing, and build an information system by prioritizing environmentally friendly materials and limiting broadcasts during peak hours to preserve the tranquil atmosphere of the scenic area.

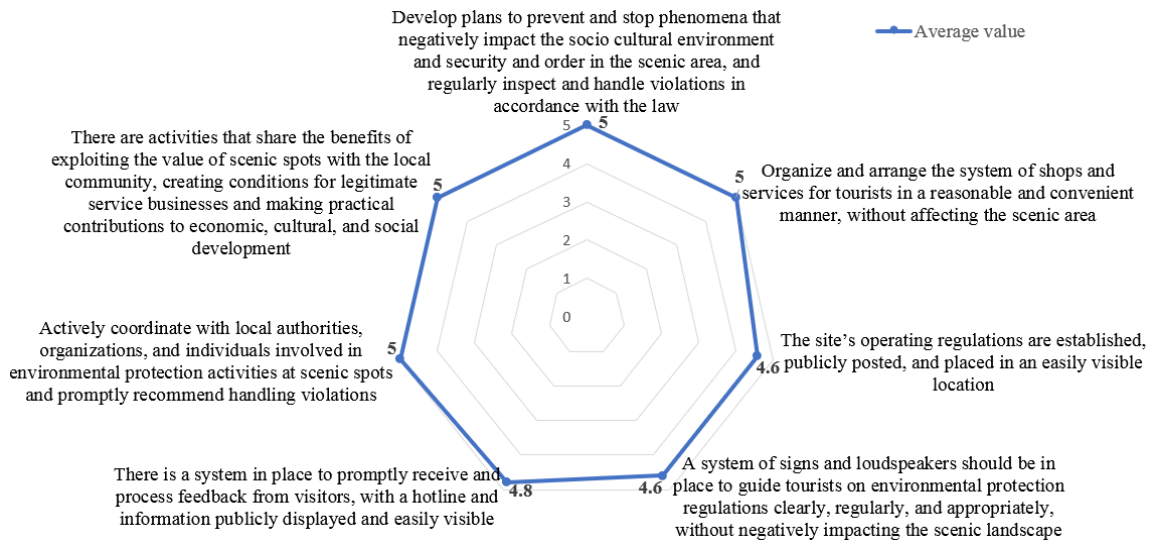


Figure 4. The levels of evaluation in socio-cultural environmental protection work at the scenic area.

Information, education, and awareness-raising activities on environmental protection at the site have achieved a very high level of effectiveness. The survey results on information, education, and awareness-raising

activities on environmental protection at the scenic site recorded absolute consensus with no dissenting or neutral opinions, with an average score of 4.8 to 5.0 (shown in **Table 5**).

Table 5. Levels of evaluation in information and communication work at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Environmental protection regulations at the scenic site are posted in easily visible locations, either on separate boards or integrated into the site's internal regulations	0.0	0.0	0.0	20.0	80.0	4.8
2	The posted notice clearly states the environmental protection regulations at the scenic spot	0.0	0.0	0.0	20.0	80.0	4.8
3	Develop promotional materials to showcase the value of the scenic spots and the importance of environmental protection through various media channels.	0.0	0.0	0.0	20.0	80.0	4.8
4	Organize training and education sessions on environmental protection at scenic spots at least once a year (this can be combined with other activities)	0.0	0.0	0.0	0.0	100	5.0
5	Public address systems are installed at key locations within the scenic area to provide information, raise awareness, and remind tourists to comply with environmental protection regulations	0.0	0.0	0.0	0.0	100	5.0
6	The public address system is working well, continuously, and the audio signal is clear	0.0	0.0	0.0	0.0	100	5.0

The data is divided into two distinct groups: the group of visual and proactive measures, which received a perfect score (average score = 5.0), affirms the superior effectiveness of the clear public address system at key locations and the organization of regular, at least once-a-year training sessions for staff and businesses; the group of fixed information and static materials received a very high level of agreement (average score = 4.8, including 80% strongly agree and 20% agree), emphasizing the role of publicly displaying clear regulations on-site as a legal

basis, along with the need to “green” promotional content on multimedia platforms before visitors arrive (shown in **Figure 5**). Based on this reality, the Management Board needs to optimize the public address system with concise, engaging content and incorporate English; maintain the frequency of training but innovate to increase real-world interaction; Simultaneously, a system of signage will be constructed using environmentally friendly materials and harmonious, natural colors to ensure both easy visibility and overall aesthetic appeal for the scenic spot.

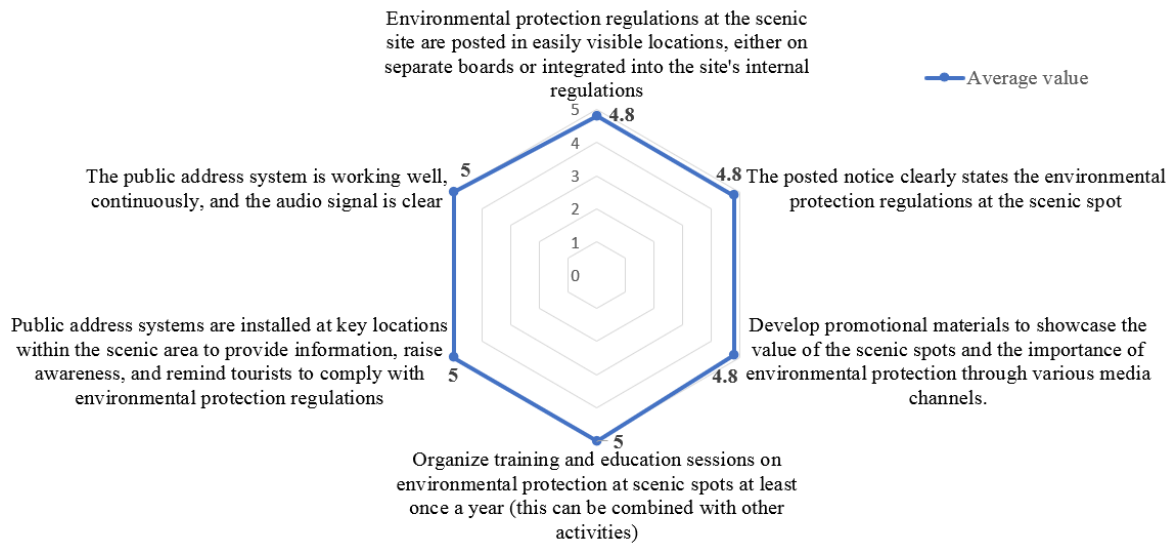


Figure 5. The levels of evaluation in information and communication work at the Marble Mountains scenic area.

4.1.2. Tourism Businesses in Environmental Protection Efforts

Overall, the awareness of businesses regarding environmental protection at the scenic site is positive, with the majority agreeing, especially regarding their responsibility

to avoid negatively impacting the heritage. The survey results for service businesses at the Marble Mountains show a clear differentiation in scores, with average values ranging from 3.83 to 4.27 (shown in **Table 6**), reflecting the conflict between environmental awareness and the pressure to maximize profits.

Table 6. Levels of assessment by tourism businesses regarding environmental protection at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Awareness and Understanding of Environmental Protection						
1.1	Understand the regulations and guidelines for environmental protection at the tourist site	3.33	0.0	16.67	60.0	20.0	3.93
1.2	Recognizing that service businesses must ensure they do not negatively impact the environment at the scenic site	3.33	0.0	16.67	46.67	33.33	4.06
1.3	Understand the standards for waste treatment, landscape protection, and ecosystem preservation in the business area	3.33	0.0	10.0	50.0	36.67	4.17

Table 6. Cont.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
2	Fulfilling Environmental Responsibilities in Business						
2.1	Regularly sort, collect, and dispose of waste in accordance with regulations	0.0	0.0	23.33	53.33	23.33	4.0
2.2	We are committed to minimizing the use of single-use plastic products and plastic bags in our business	3.33	6.67	26.67	26.67	36.67	3.87
2.3	Ensure the business area is clean and hygienic, and prevent littering that could pollute the environment	0.0	0.0	13.33	53.33	33.33	4.2
2.4	Implement measures to minimize noise, emissions, and odors that affect the environment and tourists	0.0	0.0	20.0	60.0	20.0	4.0
2.5	Always comply with regulations on landscape management and protection, and do not alter or damage the scenic landscape	0.0	0.0	23.33	53.33	23.33	4.0
2.6	Personnel, materials, and signage are regularly provided to guide tourists in complying with environmental protection regulations at the scenic site	0.0	6.67	23.33	50.0	20.0	3.83
2.7	Business activities and the display of goods at scenic spots must be in accordance with the nature and space of the scenic spot and comply with the regulations of the competent authorities	0.0	0.0	13.33	53.33	33.33	4.2
3	Cooperation and Commitment to Environmental Protection						
3.1	Coordinate with the scenic area management board in environmental protection efforts	3.33	3.33	16.67	60.0	16.67	3.83
3.2	Be prepared to educate and guide customers and employees to understand and implement environmental protection measures	0.0	3.33	6.67	56.67	33.33	4.2
3.3	Proactively and promptly report pollution issues and environmental violations to the relevant authorities	0.0	3.33	16.67	56.67	23.33	3.97
3.4	Commitment to raising environmental awareness throughout the business and service operations	0.0	0.0	16.67	50.0	33.33	4.17
3.5	Sign and fulfill environmental protection commitments with the scenic area management board and relevant authorities	0.0	0.0	10.0	53.33	36.67	4.27
3.6	Responding to and participating in environmental protection activities and sustainable tourism development in accordance with the law and implementing cooperation agreements between the parties	0.0	3.33	23.33	33.33	40.0	4.1
4	Overall Assessment and Recommendations						
4.1	We have observed that environmental protection efforts at the scenic site are receiving attention and are being implemented effectively	0.0	3.33	20.0	50.0	26.67	4.0
4.2	More training and guidance programs on environmental protection are needed for businesses and individuals	0.0	0.0	23.33	40.0	36.67	4.13
4.3	We hope to receive regular support, inspections, and monitoring from regulatory agencies to enhance our responsibility in protecting the environment	0.0	0.0	20.0	46.67	33.33	4.13

The data is divided into four trend groups: the leading group in action and commitment (average value = 4.17–4.27), demonstrated by compliance with legal agreements and maintaining hygiene at kiosks for direct economic benefits; the group with fairly good technical implementation (average value = 4.0–4.13), revealing a significant need for training and a willingness to be supervised; the hesitant group (average value = 3.93–3.97), showing a high percentage of neutrality due to unclear regulations and a reluctance to report violations; and the bottleneck group with the lowest average value (3.83–

3.87), revealing a major barrier to reducing single-use plastic waste due to its low cost and a fear of investing in infrastructure that would incur operating costs (shown in **Figure 6**). To address this issue, the Management Board needs to shift from signing agreements to organizing visual training sessions. Supporting the connection of wholesale sources for biodegradable packaging to replace plastic; simultaneously simplifying regulations with infographics, synchronizing public trash can systems, and creating an anonymous feedback channel via QR code to address real-world bottlenecks.

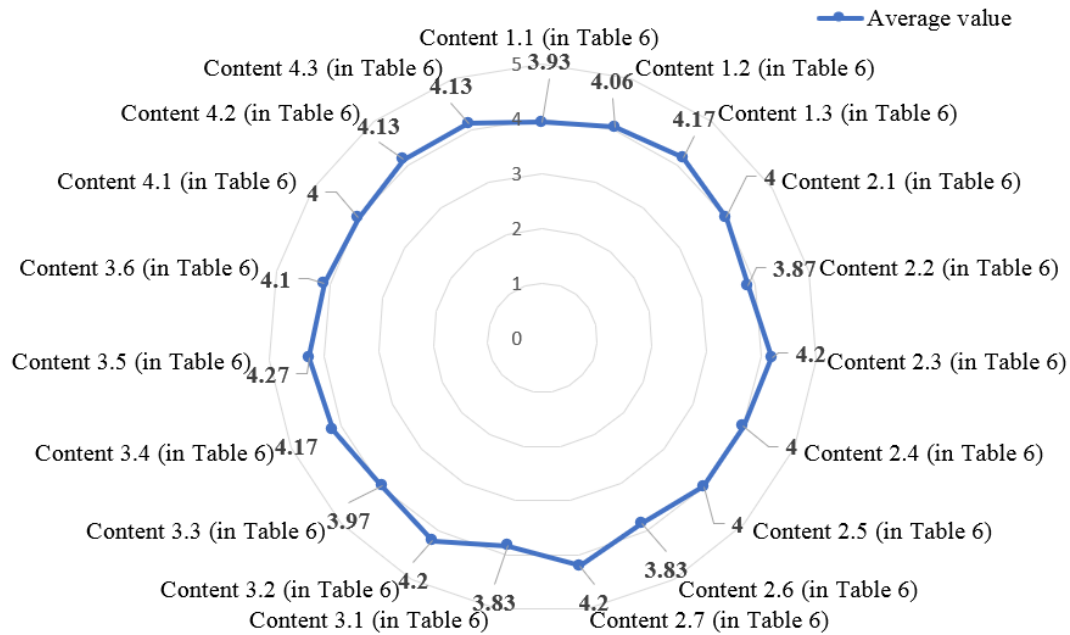


Figure 6. The levels of assessment by tourism businesses regarding environmental protection at the Marble Mountains scenic area.

A logical and close relationship following the perception–commitment–action–response model can be seen through the following points:

Positive correlation between awareness and commitment level: The analysis results indicate a direct correlation between the level of understanding and the behavior that translates into commitment by businesses. Specifically, when travel agencies achieve a high level of awareness of legal regulations (80%) and a clear understanding of the consequences for their business operations (86.67%), they proactively establish responsibility commitments with the Management Board (90%). Here, awareness plays a role as the ideological foundation shaping behavior. Notably, the rate of signing commitments even exceeds the level of pure awareness; this reflects that signing is sometimes a mandatory procedure or an administrative compliance response, but the behavior is entirely based on a solid and fundamental understanding from the outset.

The gap between epistemology and practical implementation: This is the key issue; understanding the theory does not equate to thorough implementation in practice. As evidence, although 80% of survey respondents clearly understood the negative impacts on heritage, when translating this into concrete actions such as reducing plastic waste, the percentage of positive responses dropped

significantly to only 63.34%. This phenomenon reflects a clear implementation gap in tourism environmental management. Accordingly, easily implemented and superficial activities such as cleaning facades or arranging exhibition spaces consistently achieve high implementation rates. Conversely, fundamental solutions requiring business model restructuring or incurring high operating costs, such as reducing single-use plastic products, remain a major challenge.

The causal relationship between implementation practices and support needs: Barriers and conflicts arising during practical application are the direct cause of market-related support requests. For example, while 10% of stakeholders still oppose regulations restricting plastic waste and over 23% express dissatisfaction with the current coordination mechanism, tourism businesses have revealed an urgent need for in-depth training (76.67%) and regular monitoring (80%). This reflects a shift in business thinking; they are no longer simply aware of the reasons for implementation but are genuinely struggling with the implementation methods. Therefore, they expect a synchronized, transparent monitoring mechanism to create incentives and ensure a healthy competitive environment.

The role of the Management Board as a bridge and strategic coordinator: The interaction between tourism businesses and the Management Board is the central

driving force, shaping and regulating the behavior of all other stakeholders in the heritage ecosystem. The readiness index for participating in communication activities (90%) and the rate of agreement to report violations (80%) demonstrate that travel agencies have positioned the Management Board as a strategic partner. However, the gap in actual coordination has not reached an absolute level, indicating that the bilateral communication channel is sometimes still heavily administrative and formalistic. The trend of businesses proactively proposing stricter supervision reflects a realistic expectation: they need the Management Board to shift to a more proactive stance, abandoning the role of a purely contractual party to become a direct partner in quality control on-site.

The aforementioned interactive relationship operates as a positive feedback loop; however, the current systemic bottleneck lies in the practical implementation phase. Therefore, to comprehensively improve the effectiveness of environmental protection at the Marble Mountains scenic area, a strategic shift in focus is urgently required, moving from purely awareness-raising campaigns to pro-

viding technical support solutions and establishing a synchronized enforcement monitoring mechanism, in line with the aspirations and constructive proposals from tourism businesses themselves.

4.1.3. Local People in Environmental Protection at the Marble Mountains

In environmental protection efforts at the Marble Mountains, local people play a crucial role, not only as beneficiaries but also as direct participants in monitoring, preserving, and shaping the behavior of tourists. The results of the local community survey on environmental protection at the Marble Mountains reveal a wide range of opinions and a significant number of neutral opinions (20%–40%), with a relatively high average value (3.66–4.11) (shown in **Table 7**). This provides an important practical basis for analyzing the effectiveness of current management and proposing appropriate solutions to strengthen the role of the local community in preserving and promoting the value of the Marble Mountains.

Table 7. Levels of local people's assessment of environmental protection work at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Recognizing the Value of Scenic Spots						
1.1	We believe that protecting the environment at this scenic spot directly affects the reputation of the people of Da Nang city	2.9	5.7	28.6	45.7	17.1	3.66
1.2	A clean and beautiful environment is a key factor in preserving the long term historical and cultural value of a scenic spot	0.0	2.9	40.0	34.3	22.9	3.77
1.3	Recognizing that preserving scenic spots means protecting the livelihoods and economy of the local community	0.0	0.0	25.7	60.0	14.3	3.89
2	Roles and Actions in Environmental Protection						
2.1	It is believed that local residents play a more important role than the management in monitoring daily hygiene at the tourist site	0.0	5.7	22.9	45.7	25.7	3.92
2.2	Actively limit the use of plastic bags and single use plastic items when offering incense or visiting scenic spots	0.0	2.9	28.6	57.1	11.4	3.77
2.3	Be prepared to remind tourists or others when you see them littering or damaging the scenic beauty of the tourist attraction	0.0	5.7	31.4	48.6	14.3	3.72
3	Responsibilities and Coordination in Environmental Protection						
3.1	I feel a responsibility to participate in local volunteer environmental cleanup activities	0.0	0.0	40.0	45.7	14.3	3.74
3.2	I agree that every local family has a responsibility to spread awareness about environmental protection regulations to their relatives and visitors	0.0	0.0	20.0	48.6	31.4	4.11
3.3	We support the application of strict penalties for acts of polluting scenic areas	0.0	0.0	22.9	62.9	14.3	3.92
3.4	We believe that the current cooperation between the people and the Da Nang city government in protecting the environment and scenic spots is very effective	0.0	0.0	22.9	48.6	28.6	4.06

The data is divided into three distinct groups: the leading group in terms of moral responsibility (average score = 4.06–4.11), demonstrated by agreement on educational obligations, family outreach, and belief in cooperation with local authorities; the group with a relatively high level of awareness of the role and sanctions (average score = 3.89–3.92), showing that people are willing to self-monitor and support severe penalties for acts of vandalism against heritage, although 25.7% remain neutral regarding immediate economic interests; and the group with the lowest scores in terms of practical behavior and cultural awareness (average score = 3.66–3.77), clearly revealing bottlenecks such as the habit of using plastic bags when offering incense, reluctance

to remind tourists, passivity in volunteering, and the lack of linking local responsibility at the destination with the overall reputation and civility of the people of Da Nang (shown in **Figure 7**). To address these issues, the government and management board need to launch a “Model family protecting heritage” movement combined with the installation of traffic cameras; organize a campaign to exchange plastic bags for bamboo/cloth baskets at the entrance to the Marble Mountains scenic area and provide a QR code hotline to protect those who report violations; and simultaneously enhance macro-level communication to associate the image of the scenic area with the pride and civilized honor of all the people of Da Nang city.

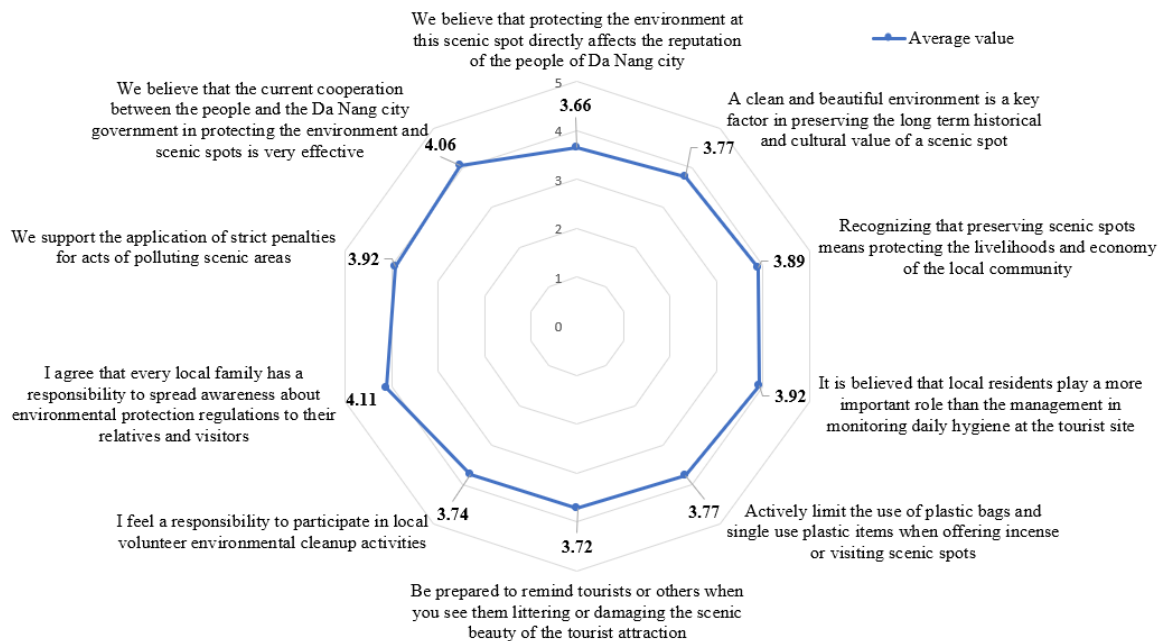


Figure 7. The levels of local people's assessment of environmental protection efforts at the Marble Mountains scenic area.

The cognitive, attitudinal, and behavioral factors of the local people do not operate as independent entities but are closely linked in a clear cause-and-effect structure. Analyzing these internal relationships provides a foundation for clarifying the complex psychological transformation process, from the perception of purely socio-economic benefits to the formation of a sense of community responsibility, promoting spontaneous actions at the local level and strengthening a substantive coordination mechanism with the government in environmental protection at the Marble Mountains scenic area.

- **The cause and effect relationship between per-**

ceived benefits and sense of responsibility: A profound cause and effect relationship exists between the level of economic benefit recognition and community responsibility, acting as a lever to promote social action. Actual data demonstrates this shift in thinking, with 74.3% of people identifying the historical site as a source of livelihood for their families. This awareness immediately transforms into a powerful motivation, leading 80% of respondents to readily fulfill their duty to promote the protection of the destination. This confirms that the collaboration between the people and the government is not merely a matter of ethics but stems from a practical, life

or death mindset. The community understands that preserving the environment of the Marble Mountains scenic area is the most effective way to protect their long-term livelihoods and tourism brand.

- **The transformation from awareness to proactive action in the field:** The correlation between awareness and behavior in the local community shows a high degree of consistency, demonstrating a successful shift from theoretical thinking to practical application in the field. Statistics show that 71.4% of people rate their own supervisory role higher than that of state management agencies, confirming the elimination of dependence and the rise of personal responsibility. Notably, the impact of awareness has transcended theoretical barriers to deeply intervene in daily life; while the environmental hygiene awareness index reached 57.2%, it became the premise that triggered 68.5% of people to commit to reducing plastic waste. This positive difference demonstrates that the intrinsic motivation from awareness is strong enough to adjust and reshape the daily habits of local residents.
- **The reciprocal relationship between indigenous communities and local authorities:** The interaction between citizens and the state administrative apparatus is no longer a one-way approach, but has developed into a sustainable synergistic mechanism, built on a foundation of consensus on discipline and institutional trust. This is clearly demonstrated by the fact that 77.2% of citizens support strict penalties, reflecting the internal need for a solid legal framework to maintain general order. More importantly, this 77.2% belief in the effectiveness of coordination with the government has become a key driving force promoting social participation, transforming into practical actions such as participating in volunteer activities (60%) and proactively reminding tourists (62.9%). Thus, trust in the capacity of public administration is an independent variable that positively impacts the self-governance behavior of the community in heritage management.
- **Structural bottlenecks in multi-stakeholder relationships:** Although social engagement indicators show high levels of positivity, survey data still reveals structural inadequacies in the relationship

between people and heritage conservation efforts. The disparity between the percentage of people agreeing with administrative sanctions (77.2%) and the willingness to intervene directly on-site (with 31.4% of respondents still hesitant) shows that the gap between legal awareness and community enforcement capacity remains a thorny issue, requiring the bridging of this gap through training programs on practical situation handling skills. Furthermore, the differentiation in priorities between economic benefits (74.3%) and historical and cultural values (57.2%) confirms that livelihood remains the most important independent variable influencing behavior. Local people tend to approach and protect historical sites primarily as a direct means of production, and only secondarily as an ideological representation of abstract spiritual values.

The relationship between these elements is a positive, closed-loop cycle. Awareness of value (benefits) creates motivation for voluntary action (monitoring) and effective coordination with the authorities (discipline) creates a favorable environment for maintaining and developing those values. High levels of consensus are the core foundation for the success of sustainable tourism at the Marble Mountains.

4.1.4. Tourists in Environmental Protection at Marble Mountains Scenic Area

Assessing the awareness and behavior of tourists is a key factor in sustainable management at Marble Mountains scenic area. The results of the field survey aim to clarify tourists' attitudes towards environmental protection responsibilities, the level of compliance with regulations at the destination, and their willingness to cooperate in heritage conservation. Through quantitative indicators on four main content groups (shown in **Table 8**): (1) Awareness and attitude; (2) Actual behavior during visits; (3) Social behavior and cooperation; (4) Perceived impact and personal commitment, an objective database will be provided to evaluate the effectiveness of current propaganda work. At the same time, the report proposes appropriate management solutions to minimize the negative impacts of tourism activities on the ecosystem and unique landscape of the scenic area.

Table 8. Tourist ratings of environmental protection efforts at the Marble Mountains scenic area.

No.	Survey Content	Levels of Agreement (%)					Average Value
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
1	Perception and Attitude						
1.1	Understanding that tourists have a responsibility to protect the environment in the scenic area	0.0	1.0	7.5	45.0	46.5	4.37
1.2	Be aware of the regulations and guidelines regarding environmental protection in the scenic area	0.5	0.5	6.5	46.0	46.5	4.38
1.3	We believe that every small action contributes to maintaining the landscape and ecosystem in the scenic area	2.0	0.0	5.0	45.0	48.0	4.37
2	Actual Behavior While Sightseeing						
2.1	Always bring your own trash bag and dispose of your trash in the designated bins. Maintain public cleanliness in the tourist area	0.5	0.0	13.5	43.5	42.5	4.28
2.2	Limit the use of single-use plastics (plastic bottles, plastic bags, straws) when sightseeing	2.5	0.5	7.5	52.0	37.5	4.22
2.3	Please comply with environmental protection signs and instructions (no touching, no climbing, no drawing on rocks/pillars/monuments)	0.5	0.0	5.0	47	47.5	4.41
2.4	Do not draw, engrave, sign, or damage objects, natural landscapes, or scenic spots	0.0	0.0	6.0	39.0	55.0	4.49
2.5	Do not cause disturbances or disrupt public order (noise, crowding, pushing, etc.), do not create loud noises, and do not use loudspeakers or loud music that affects the surrounding environment and community	0.0	0.0	3.5	43.0	53.5	4.5
2.6	Comply with traffic regulations (walk on designated paths, do not enter prohibited areas) to protect vegetation and landscapes	0.0	0.0	4.0	42.5	53.5	4.5
2.7	Do not participate in activities that violate the law (trading, fortune telling, causing disturbances, etc.)	0.0	0.0	2.5	47	50.5	4.48
2.8	Appropriate attire for visiting tourist attractions (not offensive)	0.0	0.0	4.5	40.0	55.5	4.51
2.9	Always treat staff and other guests with courtesy and respect	0.0	0.0	43.0	5.0	52.0	4.09
3	Social Behavior and Cooperation						
3.1	If I see other tourists violating the rules (littering, vandalizing, damaging the landscape), I will remind them or report it to the management staff	0.0	2.5	11.0	48.5	38.0	4.22
3.2	Be prepared to share information and guide friends or companions to engage in environmentally friendly behaviors	0.0	0.0	9.0	51.0	40.0	4.31
3.3	It would be appreciated if the site management had signs, banners, and specific instructions on environmental protection so that visitors could easily observe and follow them	0.0	0.0	6.0	48.0	46.0	4.4
3.4	It is believed that the management of the scenic area should place trash cans, recycling stations, waste collection points, and assign guides to supervise and guide visitors	0.0	0.0	2.5	48.0	49.5	4.47
4	Experience the Impact and Make a Personal Commitment						
4.1	There are concerns that if the number of visitors is large and not properly managed, the environment will be severely affected	0.0	0.0	6.5	47.5	46.0	4.4
4.2	We believe that if every tourist is mindful, the scenic spots will be better preserved for future generations	1.0	0.0	3.0	41.0	55.0	4.49
4.3	Be prepared to comply with any additional regulations related to environmental protection during your visit	0.5	0.0	2.5	40.5	56.5	4.47

The survey results on the awareness, behavior, and social conduct of tourists at the Marble Mountains recorded a very high level of agreement, with an extremely low rate of disapproval (below 2.5%) and an ideal average value ranging from 4.09 to 4.51. The data was divided into four distinct groups: the leading group showed the highest level of self-awareness (average score = 4.50–4.51) through wearing appropriate clothing, adhering to walking paths that protect vegetation, and not using loud music that caus-

es disorder; the group with a strong sense of conservation and respect for the law (average score = 4.40–4.49) clearly demonstrated through not vandalizing, not engaging in illegal fortune-telling, accompanied by concerns about overcrowding during peak season and a desire for the management board to strengthen the system of directional signs and trash cans; The group with the basic awareness (average score = 4.28–4.38) noted that tourists understood environmental protection regulations but were slow to bring person-

al trash bags due to awkwardness in large spaces; the group with the lowest scores (average score = 4.09–4.22) revealed limitations in habits of reducing plastic waste, a fear of confrontation leading to avoidance of reminding others to litter, and especially a serious decline in the criterion of polite and civilized behavior (43% neutral opinions) due to crowding and hot weather during large gatherings (shown in **Figure 8**). Based on this reality, the management board of scenic area

needs to strictly maintain cultural standards regarding clothing and noise; increase the density of sorting bins and install free water stations to reduce the use of single-use plastic bottles; Simultaneously, integrate quick feedback QR codes to support indirect monitoring and arrange user-friendly visual signage to regulate the psychological stress of tourists, thereby improving the quality of civilized behavior at the destination.

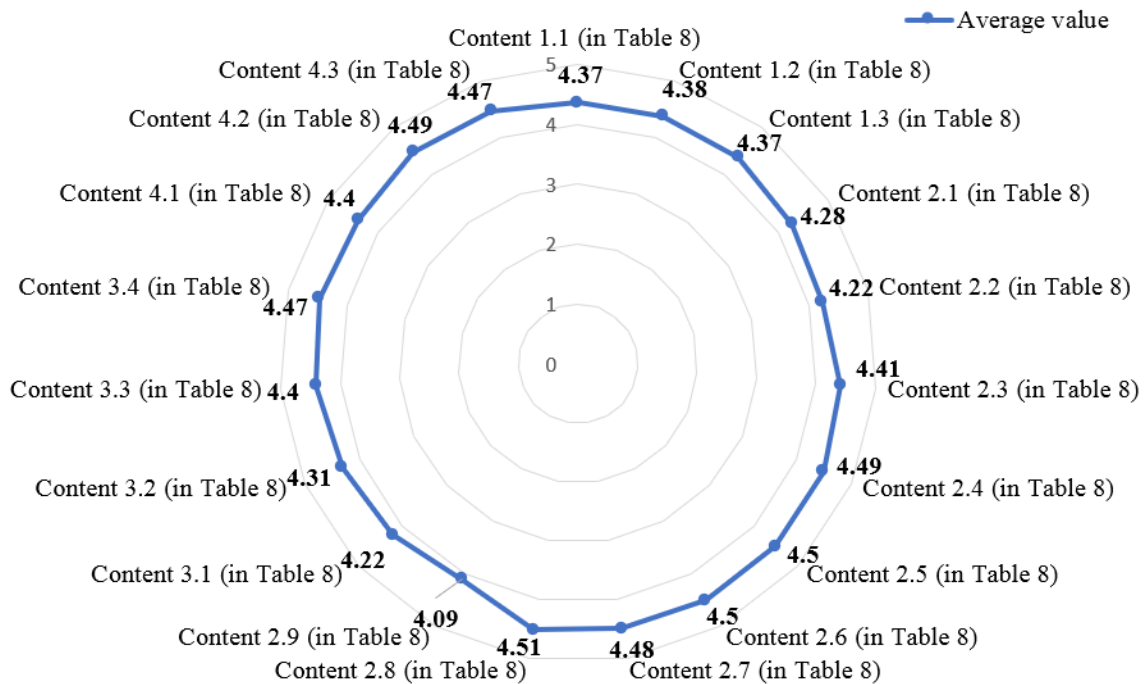


Figure 8. The levels of tourist evaluation of environmental protection efforts at the Marble Mountains scenic area.

Environmental protection efforts at the scenic site are receiving strong support and positive changes from tourists, with a very positive response rate. The relationship between visitor awareness and action can be summarized through four main points:

Superior awareness and effective behavioral transformation among tourists: Survey results show a positive trend where tourists' awareness goes beyond theoretical understanding and translates into concrete actions on the spot. The fact that over 90% of respondents understand the regulations, coupled with high rates of civilized behavior such as proper waste disposal (86%), refraining from vandalism (94%), and respecting the sanctity of the spiritual space (95.5%), demonstrates the emergence of a highly socially responsible segment of visitors. This is the most crucial foundation for successfully shaping and operating a

sustainable tourism model at the Marble Mountains scenic area.

The shift from self-awareness to community monitoring behavior: A strategic highlight noted from the research data is the willingness of tourists at the Marble Mountains to cooperate and intervene socially. With over 86% of respondents willing to point out wrongdoings and 91% proactively guiding friends to comply with regulations, tourists are gradually shifting their role to become voluntary forces on-site. This proactive participation plays a crucial role in supporting the management board's efforts to expand the monitoring network and maintain order in the natural and cultural environment of the Marble Mountains.

Areas for improvement in social behavior culture: Although indicators of awareness of preserving physical

objects and historical landscapes show very positive results, the actual interaction between stakeholders at the destination, including communication between tourists and staff and other visitors, is only at an average level, with 43% of respondents rating it as normal. This situation indicates that tourism culture at the Marble Mountains needs to be further developed in terms of communication skills and humane behavioral norms, instead of being limited solely to complying with administrative regulations.

Strategic expectations regarding the coordinating role of the management board: Despite possessing a high sense of personal responsibility, visitors assert that any unilateral efforts from their side will not be optimally effective without a corresponding supporting infrastructure. Evidence of this is the 97.5% agreement rate on the need for additional trash cans and increased supervisory personnel, combined with 97% willingness to comply with new regulations, showing that visitors are creating favorable conditions for stricter management measures in the future. This widespread consensus reflects the public's genuine concerns about the future of the Marble Mountains scenic area and sends a strong signal about the need for a more professional and decisive management approach from the authorities.

Today's tourists are a highly conservation-conscious group and are willing to support the Marble Mountains. However, to ensure sustainability, the management board needs to focus on improving technical infrastructure (trash cans) and enhancing the quality of service interaction, aiming to transform theoretical commitments into a truly civilized, clean, and friendly tourism environment.

The relationship between perception and attitude, actual behavior during sightseeing, social interaction and cooperation, perceived impact and personal commitment creates a closed psychological and behavioral cycle, moving from internal perception to external impact and future commitment. This can be likened to the responsible journey of a civilized tourist.

Awareness is the prerequisite for shaping and regulating individual behavior: Research results indicate a linear and consistent transformation process from thinking to practical action among tourists. With 91.5% of respondents clearly aware of their personal responsibility towards the destination, the inevitable consequence is that practical

behaviors on-site, such as refraining from vandalism (94%) and maintaining public order (96.5%), are more effective. Notably, the understanding that a small action can have a significant impact (93%) completely eliminated the subjective belief that an individual's misconduct will not affect overall development.

The shift from individual awareness to collective responsibility: This relationship represents a systemic upgrade in thinking, moving from individual compliance to the standardization of behavior for the entire community. Since the majority of tourists voluntarily dispose of waste properly (86%), they perceive themselves as having the legal and moral authority to remind others of deviant behavior (86.5%) or guide their network of friends (91%). Good practice of civilized behavior on-site forms the core basis for tourists' willingness to assume the role of a voluntary supervisor at the site. However, a bottleneck lies in the fact that the percentage of tourists rating the quality of bilateral communication as only average (43%), indicating that despite strong motivations for social intervention, tourists still lack interaction skills and subtlety in practical communication.

Concerns about the future are the driving force behind cooperation: Tourists' sense of responsibility doesn't stem from coercive administrative sanctions, but rather from deep-seated worries about the degradation of heritage spaces. The fact that 93.5% of tourists expressed concern about overcrowding and negative impacts on the natural environment is the driving force behind the record-high consensus of 97.5% in wanting the management board to tighten supervision and improve technical infrastructure. Tourists are willing to accept stricter management because they understand that it is the only way to preserve the heritage sites in the long term.

The positive feedback loop in reinforcing epistemology: This connection establishes a highly sustainable cycle in the psychological behavior model of tourists. When 96% of survey respondents firmly believe that individual consciousness is key to preserving heritage for future generations, this immediately reinforces and deepens their awareness of intrinsic responsibility. This demonstrates that awareness is not a static quantity, but operates as a self-refining ecosystem where humanistic values, once received, continuously regenerate and upgrade the sub-

ject's sense of responsibility.

The aforementioned interactive relationships do not exist in isolation but support each other dialectically along a linear path: perception guides behavior, actual behavior lays the groundwork for the formation of community responsibility, and community responsibility is guaranteed by long-term heritage preservation commitments. The most important takeaway from this model is that tourists are now in a highly prepared state psychologically and consciously. They are not merely acting on their own initiative, but are also proactively expressing their desire for the management board of the Marble Mountains to provide better guidance, coordination, and stricter control to protect the integrity of the heritage site.

4.2. Limitations of the Multi-Stakeholder Coordination Mechanism in Environmental Management at the Marble Mountains

Although the coordination mechanism among stakeholders at the Marble Mountains scenic area has achieved many positive results, the actual operation still reveals strategic bottlenecks and internal barriers that need to be identified and thoroughly addressed:

The gap between commitment and implementation by tourism businesses: This is a typical limitation in the interaction model between the management board and tourism businesses, most clearly demonstrated in the handling of specific waste. Although 90% of businesses signed cooperation agreements, the actual rate of implementing measures to reduce plastic waste and plastic bags only reached 63.34%—the lowest rate recorded in the entire survey data. The phenomenon of commitment exceeding awareness reflects a management reality where signing sometimes serves only as a mandatory administrative procedure or a reactive compliance response rather than a genuine commitment. The biggest obstacle currently is the pressure to change business models; Tasks requiring restructuring of operating systems or incurring high input costs, such as reducing single-use plastic products, remain macro-level challenges, in contrast to more superficial, easily implemented activities like renovating and cleaning the storefronts of business premises.

Infrastructure barriers and limitations in tourists' social interaction capabilities: Although tourists are

noted to be highly conscientious, their actual coordination effectiveness is hampered by both objective and subjective factors. Objectively, the lack of supporting technical infrastructure is a major bottleneck, with 97.5% of tourists stating that individual efforts would be ineffective without essential tools such as sorting bins, recycling stations, and on-site monitoring personnel. Subjectively, social interaction capabilities at the Marble Mountains are still limited; the level of interpersonal communication, including interaction between tourists and staff and other visitors, is only at an average level, with 43% rating it as normal. Furthermore, cross-monitoring capacity within the community still faces psychological barriers, with 31.4% of local residents and a segment of tourists admitting to hesitation and a lack of tactful communication skills when directly addressing misconduct, preventing the collective self-governance mechanism from achieving optimal effectiveness.

Lack of synchronization in awareness and resources of local communities: This limitation is clearly revealed through two aspects, thinking and practical action. Firstly, the pragmatism in heritage conservation, the awareness index of long-term historical and cultural value (57.2%) is significantly lower than the level of recognition of direct economic benefits (74.3%). This situation demonstrates that the motivation for environmental protection among residents is mainly driven by livelihood pressures, potentially posing systemic risks if economic income sources fluctuate or decline. Secondly, the weakness in social mobilization, the mobilization of resources from the community remains deeply fragmented, with up to 40% of survey respondents only agreeing in a purely conceptual sense, failing to elevate it to absolute consensus and action.

The coordinating role of the management board has not been decisive and substantive: This limitation is clearly evident in the current operational structure and multi-stakeholder interaction methods. Firstly, communication channels remain largely formal, reflected in the fact that the actual coordination rate between tourism businesses and the management apparatus has not reached absolute perfection. Secondly, the arrangement of technical infrastructure is not optimal, as evidenced by the lowest satisfaction index regarding the placement of waste collection equipment in the entire survey, at 60%. This situation necessitates a comprehensive review of the overall planning

to ensure that the infrastructure system is both easily identifiable for tourists and does not infringe upon the solemnity of the spiritual heritage site. Finally, the study identifies an urgent need for a stronger leadership role from the governing body. Stakeholders, particularly the private sector and visitors, expect the management board to proactively move beyond mere awareness-raising efforts and assume the role of providing technical support solutions and directly supervising implementation on-site.

4.3. Proposed Mechanism for Multilateral Coordination in Environmental Management at the Marble Mountains Scenic Area

Based on the limitations analyzed, this study proposes a multi-stakeholder coordination mechanism for environmental management at Marble Mountains scenic area following the “Shared responsibility–Linked benefits” model, focusing on shifting from awareness to practical action as follows:

Improving the coordination mechanism between the management board and tourism businesses: It is necessary to eliminate the gap between the signing of commitment documents and actual actions, especially regarding plastic waste control. The management apparatus needs to shift its mindset from mere propaganda and awareness campaigns to providing in-depth technical support solutions; in which, the management board should not only focus on mass media communication but also directly guide businesses on alternative options to plastic bags and single-use plastic products. Simultaneously, establishing a regular monitoring system is an urgent requirement to meet the aspirations of 80% of businesses that desire strict control, creating a healthy and fair competitive environment. Authorities must play the role of the main entity controlling quality on-site, rather than merely conducting post-inspection based on administrative documents. Finally, it is necessary to institutionalize training activities through the organization of regular intensive training programs at least once a year, focusing on equipping the staff of travel businesses with skills in waste management and heritage landscape preservation.

Improving the coordination mechanism between the management board and the local community: Maximizing the self-reliance of local people, based on data

showing that 71.4% of residents affirm their supervisory role is more decisive than that of the state management apparatus. It is necessary to establish a community-led heritage management model to promote a fundamental shift from a passive mindset, relying on administrative sanctions, to an active stance of taking responsibility for environmental protection through a network of local self-governing organizations. To fill the gap in action capacity, it is necessary to implement in-depth training programs on practical social skills, thoroughly addressing the barrier of fear of direct confrontation, as evidenced by the 31.4% of residents who are not yet willing to speak up, by equipping them with civilized communication skills and tactful responses when dealing with violations by tourists. Simultaneously, it is necessary to institutionalize a transparent benefit-sharing mechanism and continue to maintain and expand legitimate business spaces for the people, because the goal of ensuring livelihoods at a rate of 74.3% remains the most important independent variable driving and sustainably maintaining awareness of heritage preservation.

Improving the coordination mechanism between the management board and tourists: The core orientation is to build a synchronized technical infrastructure system to support and realize responsible tourism at the destination. Firstly, it is necessary to optimize physical infrastructure to create favorable conditions for public self-awareness, review and replan the distribution of trash cans and waste collection points in easily identifiable locations without harming the spiritual architectural space of the heritage site. This solution directly addresses the expectations of 97.5% of tourists regarding the need for additional environmental support tools. Secondly, it is necessary to build a visual and multilingual information system by upgrading the signage and regulations to a modern style, and increasing bilingual English–Vietnamese illustrations to ensure that 100% of visitors can easily access and understand the information. Thirdly, it is necessary to establish a 24/7 continuous feedback and interaction mechanism, maintaining a publicly available hotline to promptly receive and handle environmental complaints from tourists, contributing to strengthening and increasing the institutional trust index, which currently stands at 80% absolute satisfaction.

The four-party coordination model (Management

board–Tourism businesses–Local community–Tourists) creates a closed loop of responsibility and supervision (shown in **Figure 9**):

- (1) **Management board—The coordinating and solution-creating core:** The management board plays a key, decisive role in maintaining the balance between economic growth, tourism development, and ecosystem conservation.
- (2) **Tourism businesses—The green business implementation entity:** Businesses play a role in transforming sustainable values into business practices. Beyond simply complying with waste treatment standards or reducing plastic waste, tourism businesses also consider the management board as a strategic partner to jointly monitor, report violations, and proactively spread the spirit of environmental protection to each customer.
- (3) **Local community—Dedicated self-governing**
- (4) **Tourists—Voluntary and responsible supervisors:** In the era of civilized tourism, customers are no longer entities outside the conservation effort. They are willing to comply with strict regulations, respect the solemnity of the relics and practice a green lifestyle. More than just a visitor, each tourist becomes an amateur supervisor, ready to remind friends and the community, creating a positive ripple effect in the tourism network.

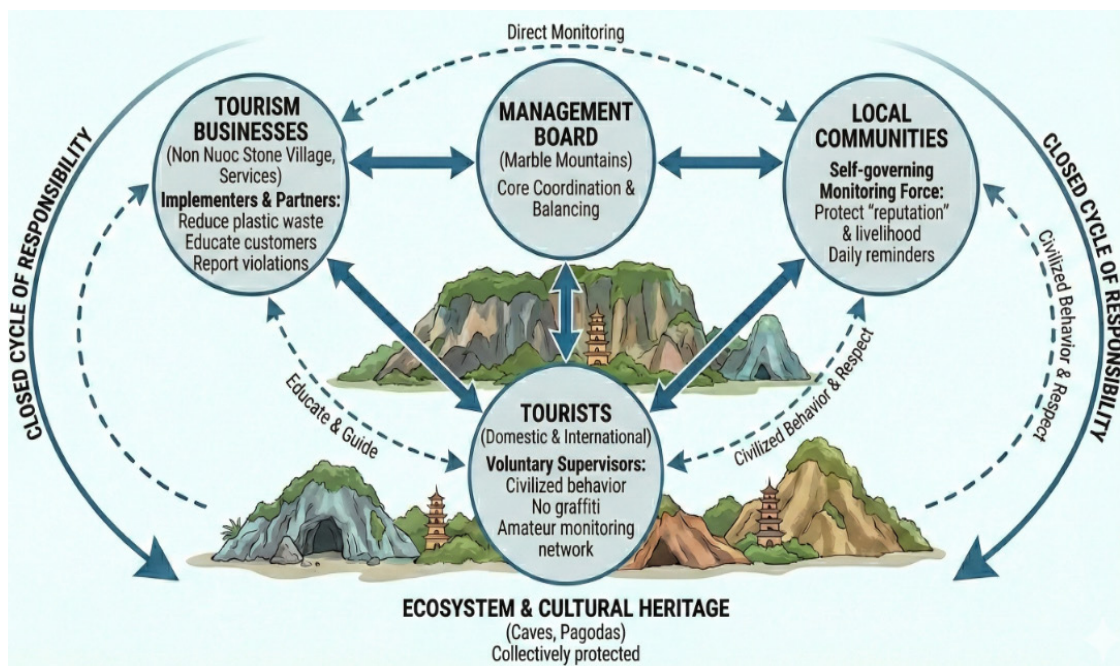


Figure 9. Modeling of the multi-stakeholder coordination mechanism at the Marble Mountains scenic area (“Shared responsibility–Linked benefits”).

The core of this model’s breakthrough lies in establishing a symbiotic governance ecosystem, where management thinking shifts dramatically from imposition to mutual support. First, the management board no longer acts as a ruler with dry administrative documents, but instead becomes a coordinating hub, proactively providing technical

infrastructure and practical solutions to empower stakeholders to fulfill their responsibilities. Within this space, tourism businesses shed the mindset of being managed to become strategic partners, recognizing that environmental protection is not a barrier, but a key to enhancing reputation and sustainable profitability. The model’s operational strength

lies in its unique cross-monitoring network, a closed circle of responsibility where local communities protect their livelihoods, tourists assess management quality and businesses monitor each other. Ultimately, the most humane value lies in fostering a sense of heritage pride, with local communities proudly preserving the beauty of their homeland and tourists voluntarily becoming conservation ambassadors. When civilized behavior is no longer a forced obligation but stems from self-awareness, the model has successfully transformed each individual into an inseparable link in the sustainable development of heritage.

The model creates a positive feedback loop: management provides infrastructure and skills training, tourism businesses and local communities implement actions and monitor on-site, and tourists comply and provide feedback through interactive channels. Practical difficulties are fed back to management so they can adjust support mechanisms (technical support instead of just advocacy).

5. Discussion

This study goes beyond merely describing the current situation; it also contributes new perspectives to the theoretical framework of sustainable management. Firstly, it enriches behavioral theory by providing insightful explanations of the gap between perception and action. The research demonstrates that ideal environmental perceptions cannot spontaneously translate into actual behavior without key regulatory elements such as supporting infrastructure and social communication skills. Secondly, the study expands stakeholder theory by establishing a symbiotic ecosystem where ethical responsibility is based on sustainable economic benefits. This approach provides a pragmatic theoretical framework that optimizes the mobilization of social components to participate in heritage protection. Finally, by proposing the concept of anonymous digital monitoring, the study modernizes the traditional public management model, affirming the role of technology in empowering tourists with direct monitoring capabilities.

The research findings are not only academically valuable but also provide empirical data to help policymakers and businesses adjust their operational strategies. For management agencies, the study suggests a shift in mindset from purely propaganda to supportive action, focus-

ing on standardizing technical infrastructure and training communities in environmental behavior skills. For tourism businesses and local people, establishing a transparent benefit-sharing mechanism will transform conservation into a livelihood driver, encouraging them to voluntarily become stakeholders in heritage preservation. In particular, for tourists, the presence of a 24/7 feedback system not only enhances monitoring effectiveness but also affirms respect for community rights, thereby building trust and credibility for the destination brand.

Despite achieving positive results, the study still has some limitations that need to be considered objectively. Regarding representativeness, due to the specific spatial and temporal characteristics of the survey, the indicators of perception may fluctuate with the tourist season or be influenced by the unique local characteristics of each region. Psychologically, the study is susceptible to bias due to the tendency to respond based on expectations, as survey subjects may provide answers that align more with ethical norms than with actual behavior. Technically, the proposed digital feedback system solution is currently only at the theoretical framework and simulation level, lacking the opportunity for empirical evaluation in the face of telecommunications infrastructure barriers in isolated areas or actual operating costs.

Given the limitations mentioned above, further research could be expanded in the following main directions. Firstly, experimentally implementing the technology model through pilot projects at specific heritage sites to measure user responses in the most realistic way. Secondly, applying economic models to quantify the optimal benefit-sharing ratios among the state, businesses, local people, and tourists, aiming to create the most sustainable linkages. Thirdly, conducting multi-point comparative studies to identify differences in coordination mechanisms between different types of cultural heritage and nature reserves, thereby finding the specific variables impacting each governance model.

6. Conclusions

The study confirms that shifting from a unilateral administrative management model to a multi-party coordination mechanism is essential for the sustainable preserva-

tion of the Marble Mountains scenic area.

In terms of the current situation: The study has identified core “bottlenecks”, particularly the formality in commitments made by tourism businesses and the lack of technical infrastructure to support tourists.

Regarding the proposed model: The “Shared responsibility - Linked benefits” model has proven feasible through the establishment of a closed-loop monitoring cycle. In this model, the management board plays the role of a coordinating core instead of just an administrative gatekeeper.

Regarding policy implications: Instead of stopping at spontaneous monitoring activities, this model aims to establish organized and legally recognized self-governing groups. Under the chairmanship of the People’s Committee of the ward, in close coordination with the Farmers’ Association, Women’s Association, and Youth Union, this mechanism will create a shield to protect heritage from within the community. Environmental budget funds will be utilized to organize in-depth management training courses. According to the roadmap, heritage conservation self-governing groups will be established, followed by the issuance of regulations and training in environmental management skills. The effectiveness of the model will be directly measured by the number of violations detected and the level of satisfaction of residents with their ownership rights at the local level.

To create a sustainable financial source for conservation efforts, a Heritage Environmental Protection Fund will be established based on the principle of sharing benefits between the economy and the environment. The management board of the Marble Mountains will play a central role, connecting with the Tourism Association and businesses in Da Nang city to operate the fund from a percentage of entrance ticket revenue and voluntary contributions. This mechanism is built on the legal framework of the Environmental Protection Law, ensuring transparency through a dedicated accounting team. In the initial phase, the Heritage Environmental Protection Fund will focus on establishing a fair contribution structure before proceeding to pilot green infrastructure projects such as local wastewater treatment systems or smart trash cans. The key KPIs will be the total annual budget mobilized and the number of green buildings upgraded from this socialized capital.

In the age of technology, every tourist will become an anonymous observer, contributing to positive pressure on environmental management through digital solutions. The Da Nang Department of Tourism, in collaboration with the Da Nang Department of Science and Technology, will deploy a chatbot system and a multimedia feedback application (images, GPS location) integrated directly into the tourism portal. Leveraging resources from the Smart City project ^[27], multilingual (Vietnamese, English, Chinese, Korean) signs with QR codes will be installed at environmental hotspots to facilitate interaction with tourists. The implementation roadmap will transition from software development to on-site installation. The success of the solution will be assessed based on the amount of feedback received through the system and the speed of response and processing by relevant authorities, thereby enhancing transparency and accountability.

Author Contributions

Conceptualization, N.T.T., D.T.T. and N.T.H.; methodology, N.T.T.; validation, N.T.T.; formal analysis, N.T.T.; investigation, N.T.T., D.T.T. and N.T.H.; data curation, N.T.T.; writing—original draft preparation, N.T.T.; writing—review and editing, N.T.T.; visualization, N.T.T.; supervision, N.T.T.; project administration, N.T.T.; funding acquisition, N.T.T. All authors have read and agreed to the published version of the manuscript.

Funding

This research is funded by the Funds for Science and Technology Development of the University of Danang under project number B2025-DN03-17.

Institutional Review Board Statement

The study does not require ethical approval.

Informed Consent Statement

Not applicable.

Data Availability Statement

The authors agree to share their research data upon request.

Conflicts of Interest

The authors declare no conflict of interest.

AI Use Statement

In the preparation of this work, the authors used Google Gemini only as a graphics rendering aid to generate **Figure 9: Modeling of the Multi-Stakeholder Coordination Mechanism in the Marble Mountain Scenic Area (Shared Responsibility and Linked Interests)**. All conceptual frameworks, textual descriptions, logical structures, and analytical interpretations presented in this figure were independently conceived and provided by the authors. The AI tool only visualized the established model according to the authors' explicit instructions. The authors take full responsibility for the integrity and accuracy of the work.

References

- [1] Prime Minister, 2018. Decision No. 1820/QĐ-TTĐ on Ranking Special National Monuments. Prime Minister: Hanoi, Vietnam (in Vietnamese.)
- [2] Mai, P.T.X., 2022. Ma Nhai at Ngu Hanh Son Scenic Area—An Important Documentary Heritage for the Asia-Pacific Region. Da Nang Museum: Da Nang, Vietnam (in Vietnamese.)
- [3] Ministry of Culture, Sports and Tourism, 2021. Decision No. 601/QĐ-BVHTTĐL to Include the Traditional Quan The Am Ngu Hanh Son Festival (Ngu Hanh Son District, Da Nang City) in the National List of Intangible Cultural Heritage. Ministry of Culture, Sports and Tourism: Hanoi, Vietnam (in Vietnamese.)
- [4] Management Board of Marble Mountains Scenic Area, 2023. Report on the Implementation of Tasks in 2023 and Directions and Tasks for 2024. Management Board of Marble Mountains Scenic Area: Da Nang, Vietnam (in Vietnamese.)
- [5] Management Board of Marble Mountains Scenic Area, 2024. Report on the Implementation of Tasks in 2023 and Directions and Tasks for 2025. Management Board of Marble Mountains Scenic Area: Da Nang, Vietnam (in Vietnamese.)
- [6] Management Board of Marble Mountains Scenic Area, 2025. Report on The Implementation of Tasks in 2023 and Directions and Tasks for 2026. Management Board of Marble Mountains Scenic Area: Da Nang, Vietnam (in Vietnamese.)
- [7] Freeman, R.E., 2015. Strategic Management: A Stakeholder Approach. Cambridge University Press: Cambridge, UK. DOI: <https://doi.org/10.1017/CBO9781139192675>
- [8] Bramwell, B., Lane, B., Cooper, C., et al., 2000. Tourism Collaboration and Partnerships: Politics, Practice and Sustainability. Multilingual Matters & Channel View Publications: Bristol, UK. DOI: <https://doi.org/10.2307/jj.27195484>
- [9] Ansell, C., Gash, A., 2008. Collaborative governance in theory and practice. Journal of Public Administration Research and Theory. 18(4), 543–571. DOI: <https://doi.org/10.1093/jopart/mum032>
- [10] Nicholas, L., Thapa, B., 2010. Visitor perspectives on sustainable tourism development in the Pitons Management Area World Heritage Site, St. Lucia. Environment, Development and Sustainability. 12, 839–857. DOI: <https://doi.org/10.1007/s10668-009-9227-y>
- [11] Aas, C., Ladkin, A., Fletcher, J., 2005. Stakeholder collaboration and heritage management. Annals of Tourism Research. 32(1), 28–48. DOI: <https://doi.org/10.1016/j.annals.2004.04.005>
- [12] Waligo, V.M., Clarke, J., Hawkins, R., 2013. Implementing sustainable tourism: A multi-stakeholder involvement management framework. Tourism Management. 36(1), 342–353. DOI: <https://doi.org/10.1016/j.tourman.2012.10.008>
- [13] Wondirad, A., Tolkach, D., King, B., 2020. Stakeholder collaboration as a major factor for sustainable ecotourism development in developing countries. Tourism Management. 78, 104024. DOI: <https://doi.org/10.1016/j.tourman.2019.104024>
- [14] Holladay, P.J., Dixon, A.W., Nguyen, M.C., et al., 2020. Stakeholder perceptions of Da Nang, Vietnam as a tourism gateway city. Journal of Tourism Insights. 10(1), 8. DOI: <https://doi.org/10.9707/2328-0824.1089>
- [15] Panagiotopoulou, P., Skoultos, S., 2025. Stakeholders' Involvement in Sustainable Destination Management: A Systematic Literature Review of Existing Multi-Stakeholder Frameworks and Approaches. Tourism and Hospitality. 6(5), 250. DOI: <https://doi.org/10.3390/tourhosp6050250>
- [16] Mendoza, H.M., Talavera, A.S., 2025. Governance Strategies for the Management of Museums and Heri-

- tage Institutions. *Heritage*. 8(4), 127. DOI: <https://doi.org/10.3390/heritage8040127>
- [17] Singh, S., Chaudhary, D., Kumar, A., et al., 2026. Governance Models For Heritage Resource Management: Balancing Preservation, Tourism, and Community Empowerment. *Scientific Culture*. 12(2.1), 243–256.
- [18] Urošević, N., Rakitovac, K.A., Legović, M., 2026. Heritage Management and Sustainable Tourism: A Systematic Literature Review. *Encyclopedia*. 6(4), 78. DOI: <https://doi.org/10.3390/encyclopedia6040078>
- [19] Swarbrooke, J., 1999. *Sustainable Tourism Management*. CABI Publishing: New York, NY, USA. DOI: <https://doi.org/10.1079/9780851993140.0000>
- [20] Byrd, E.T., 2007. Stakeholders in sustainable tourism development and their roles: Applying stakeholder theory to sustainable tourism development. *Tourism Review*. 62(2), 6–13. DOI: <https://doi.org/10.1108/16605370780000309>
- [21] Jamal, T.B., Getz, D., 1995. Collaboration theory and community tourism planning. *Annals of Tourism Research*. 22(1), 186–204. DOI: [https://doi.org/10.1016/0160-7383\(94\)00067-3](https://doi.org/10.1016/0160-7383(94)00067-3)
- [22] Pedersen, A., 2002. *Managing Tourism at World Heritage Sites: A Practical Guide for World Heritage Site Managers*. UNESCO World Heritage Centre: Paris, France. Available from: <https://whc.unesco.org/en/documents/3181>
- [23] National Assembly, 2020. *Law on Environmental Protection*. National Assembly: Hanoi, Vietnam.
- [24] National Assembly, 2024. *Law on Cultural Heritage*. National Assembly: Hanoi, Vietnam.
- [25] The Government of Vietnam, 2017. Decree No. 109/2017/ND-CP: *The Management and Protection of World Cultural and Natural Heritage Sites in Vietnam*. The Government of Vietnam: Hanoi, Vietnam.
- [26] Yamane, T., 1967. *Statistics: An Introductory Analysis*, 2nd ed. Harper and Row: New York, NY, USA.
- [27] Da Nang City People's Committee, 2022. Decision No. 934/QĐ-UBND on the Issuance of the Plan for Implementing the Project “Building a Smart City in Da Nang City in the Period 2018–2025, with Orientation to 2030”. Da Nang City People's Committee: Da Nang, Vietnam (in Vietnamese.)