



THE IMPACT OF ENVIRONMENTAL ATTRIBUTES OF SUSTAINABLE TOURISM ON VIVID MEMORY AND ITS EFFECT ON THE BEHAVIORAL INTENTIONS OF INTERNATIONAL TOURISTS IN LIKUPANG AND MANADO

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ABSTRACT

This study aims to analyze the influence of environmental attributes in sustainable tourism on vivid memory and its impact on the behavioral intentions of international tourists visiting Likupang and Manado. The research employed a quantitative survey method conducted both online and onsite, involving 140 international tourist respondents who visited Likupang or Manado. The findings indicate a significant relationship between environmental attributes, vivid memory, and tourists' behavioral intentions. These results provide valuable insights for tourism managers and policymakers in enhancing the appeal of sustainable tourism through environmental attributes to influence tourists' behavioral intentions. Furthermore, the study highlights the role of vivid memory in shaping tourists' future decisions to visit other destinations in Indonesia.

Keywords: behavior intention, environmental attribute, Likupang, Manado, tourism, vivid memory

1. Introduction

In 1987, the World Commission on Environment and Development (WCED), established by the United Nations, published a report titled *Our Common Future*, which popularized the concept of the Triple Bottom Line (Commission on Environment, n.d.). This concept refers to the evaluation of an organization's performance across three sectors: environmental sustainability, social responsibility, and economic viability (Varriale et al., 2023). This assessment requires sustainable development to balance the needs of present and future generations, ensuring that economic growth and environmental protection progress hand in hand for long-term benefits to a nation, with a focus on responsible preservation and management of natural resources.

Sustainable tourism refers to tourism that considers and addresses the economic, social, and environmental impacts of current and future activities, while meeting the needs of tourists, the industry, and local communities (UNEP-UNWTO, 2005). This study focuses on the environmental dimension of the triple bottom line concept, aligning with the current development priorities of Indonesia's Ministry of Tourism and Creative Economy. Environmental sustainability, often referred to as eco-tourism (Baloch et al., 2022), is defined as nature-based tourism that integrates education, recreation, and adventure, with a primary emphasis on the natural environment, attracting tourists with an interest in the ecological state of the destination. According to research by Lee and Xue (2020), environmental attributes pertain to the natural features, atmosphere, and attractions of a destination that provide tourists with unique and engaging experiences, enhancing their overall satisfaction. Similarly, Aydin and Alvarez (2020) define environmental attributes as characteristics related to the natural environment and its conservation. In this context, these attributes focus on prevention, mitigation, and sustainable environmental practices to ensure long-term well-being and health for all stakeholders.

In 2021, Indonesia's Ministry of Tourism and Creative Economy (Kemenparekraf) initiated a strategic effort to develop the country's tourism sector by designating five super-priority destinations (DPSP), one of which is located in Likupang, Manado, North Sulawesi. The tourism sector is a key economic

driver for the Likupang region, holding significant potential to become a renowned destination for both domestic and international tourists (Kemenparekraf, 2023). Its natural beauty has encouraged Kemenparekraf to position Likupang as a sustainable tourism destination with green and regenerative tourism potential, a concept of sustainable tourism that involves practices aimed at minimizing negative environmental impacts while contributing to the cultural, environmental, social, and economic well-being of the local community (Hussain, 2020).

In *Sustainable Tourism Development: Futuristic Approaches* (Sharma, n.d.) report and Wei et al. (2010), it is explained that ecotourism can influence an individual's long-term memory of a visited destination, creating positive impressions and fostering deeper connections between tourists and the environmental destination. Long-term memory is categorized into two types based on how individuals recall and utilize memories: explicit or declarative memory (Baddeley et al., 2020). Explicit memory is further divided into episodic memory and semantic memory. A key component of episodic memory that allows individuals to recall experiences or information vividly due to sensory details from personal experiences is known as vivid memory. Huang et al. (2023) describe vivid memory as a type of long-term memory characterized by clear and detailed recollections, often associated with visual imagery or specific sensations. The natural beauty and tranquility of a destination's environment can trigger emotional intensity in tourists, thereby enhancing the likelihood of creating remarkable experiences and vivid memories related to the destination (Zhao et al., 2022). The positive impact of tourism strengthens memory formation, enabling tourists to clearly recall past experiences (Juliana et al., 2023). Elements of these experiences, embedded in individual memory, can be recalled as credible and reliable sources of information, influencing tourists' behavioral intentions in the future (Chen et al., 2024).

This study examines the relationship between sustainability, particularly environmental attributes, and vivid memory in influencing the behavioral intentions of international tourists. In Indonesia, research on the relationship between environmental attributes and vivid memory remains limited. To address this gap, the researchers utilize vivid memory to evaluate the long-term memories generated by tourists regarding the environmental attributes of a destination and to elaborate on sustainable development in terms of environmental attributes. This study aims to explore in greater depth the influence of environmental attributes on tourists' behavioral intentions, with the research focus on Likupang and Manado aligning with the objectives of the study. Additionally, the researchers seek to understand the extent to which the vividness of tourists' memories impacts their perceptions of a destination, particularly in the context of nature-based tourism.

2. Literature Review

2.1. Environmental Attributes

Refer to practices aimed at promoting environmental sustainability among both tourists and local residents of a tourist destination (Vendries et al., 2024). According to research conducted by Lee & Xue (2020), environmental attributes are environmental factors of a tourist destination, including its atmosphere and natural attractions, which can provide tourists with a unique and engaging travel experience, ultimately leading to tourism satisfaction. In a study by Aydin & Alvarez (2020), environmental attributes are defined as characteristics related to the natural environment and its conservation. In this context, environmental attributes focus on prevention, mitigation, and sustainable environmental efforts to ensure long-term well-being and health. The concept of environmental tourism can be defined as responsible travel to natural areas that emphasizes environmental conservation and aims to improve the well-being of local communities. This definition highlights the importance of integrating environmental interactions that affect all living beings into tourism activities

2.2. Vivid Memory

According to Amin & Malik (2013), memory is categorized into two types: short-term memory and long-term memory. Long-term memory is further divided into two types based on how individuals recall and use that memory-explicit (or declarative) memory, which refers to memories that are consciously recalled and expressed, and implicit memory, which refers to memories that unconsciously influence a person's behavior (Baddeley et al., 2020).

Explicit memory itself is divided into two types: episodic memory and semantic memory. Vivid memory is a part of episodic memory, characterized by the ability to clearly recall detailed sensory aspects of a personal experience. Episodic memory is a component of autobiographical memory, which refers to the capacity to form and retrieve memories of past events, including contextual information such as time and place.

The process of memory formation involves three stages: the encoding of information into memory, the retention stage in which the information is stored, and finally the retrieval stage, where the memory can be recalled (Amin & Malik, 2013). The relationship between vivid memory, episodic memory, and autobiographical memory is interconnected and complex (Fivush et al., 2011). Huang et al. (2023) define vivid memory as a clear and detailed form of long-term memory, often accompanied by vivid imagery, particularly related to visual experiences or specific sensations.

2.3. *Behavioral Intentions*

According to Amin and Malik (2013), memory is categorized into two types: short-term memory and long-term memory. Long-term memory is further divided into two forms based on how individuals recall and utilize the information: explicit (or declarative) memory, which involves memories that are consciously retrieved and expressed, and implicit memory, which refers to memories that influence behavior unconsciously (Baddeley et al., 2020).

Explicit memory consists of two subtypes: episodic memory and semantic memory. Vivid memory is a subset of episodic memory, characterized by the clear recollection of detailed sensory elements from personal experiences. Episodic memory itself is a component of autobiographical memory, which refers to the ability to form and retrieve memories of past events, including contextual information such as time and place.

The process of memory formation includes three stages: encoding, where information is initially acquired; retention, where the information is stored; and retrieval, where the stored memory is accessed (Amin and Malik, 2013). The relationship among vivid memory, episodic memory, and autobiographical memory is highly interconnected and complex (Fivush et al., 2011). Huang et al. (2023) define vivid memory as a clear and detailed form of long-term memory, often accompanied by rich imagery, particularly related to visual experiences or specific sensory impressions.

2.4. *Relationship between Variables*

Research conducted by Kusumah (2023) explains that tourists who feel satisfied with a tourist destination are more likely to revisit and have a pleasant experience. In turn, these tourists may share their positive experiences with others, potentially attracting new visitors to the destination. The relationship between environmental attributes and behavioral intentions is also supported by research from Lee and Xue (2020), which shows that strong and memorable environmental attributes can enhance tourists' behaviors such as recommending the destination, revisiting, and spreading positive word of mouth, in alignment with sustainability values. Sustainable environmental protection is a critical concern, and tourists are generally willing to pay more for destinations that prioritize environmental sustainability, including aspects such as air and water pollution control. Based on this statement, the following hypothesis can be proposed:

H1: Environmental attributes significantly influence tourists' behavioral intentions.

In the report *Sustainable Tourism Development: Futuristic Approaches* (Sharma, n.d.), it is explained that eco-tourism can influence a person's memory of a visited destination and foster a positive impression, thereby building a deeper connection between the tourist and the natural environment of the destination. The natural beauty and tranquility of a destination's environment can trigger tourists' emotional intensity, increasing the likelihood of memorable and impactful experiences, which may lead to the formation of vivid memories associated with the destination (Zhao et al., 2022).

Vivid memory can be measured through several indicators. According to the study by Sheen & Kemp (2001), vivid memory is assessed by one's ability to mentally hear and visualize a memory, recall it,

remember spatial layout, and re-experience the emotions felt after visiting a destination. Based on this statement, the following hypothesis can be proposed:

H2: Environmental attributes significantly influence tourists’ vivid memories.

In the study by Zhao et al. (2022), vivid memory is defined as a memory impact that falls under the indicator of autobiographical memory. In this context, autobiographical memory can guide, motivate, and inspire individuals by shaping the emotional connection between tourists and a destination. A positive memory of a destination is a fundamental determinant of post-trip behavior, influencing future behaviors, attitudes, and beliefs, including the intention to revisit, recommend, and share the experience with others. When tourists’ autobiographical memory is formed, they may develop a stronger tourist identity or emotional attachment to a place, which can lead to future travel behaviors.

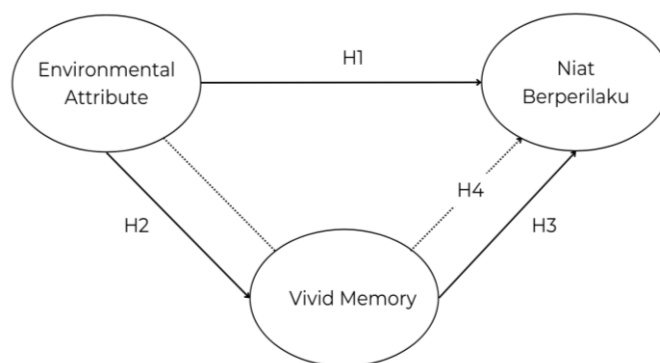
Kim et al. (2022) explain that vivid memory can influence the intensity and clarity of memories from emotionally impactful experiences, potentially evoking nostalgia and prompting tourists to seek similar experiences in the future. Therefore, the relationship between vivid memory and behavioral intention is a crucial aspect of understanding tourist behavior. Based on this statement, the following hypothesis can be proposed:

H3: Vivid memory significantly influences tourists’ behavioral intentions.

Natural beauty can create memorable experiences that stem from the emotional responses it elicits (Nakamura et al., 1992). These experiences may be stored in long-term memory (hippocampus), where the emotional significance of the experience strengthens memory traces. Furthermore, the uniqueness or aesthetic value of an environment enhances an individual's ability to recall that environment. Research by Gaib et al. (2017), which examines the role of the hippocampus, a brain region involved in memory formation and information processing shows that the hippocampus functions more effectively in integrating and processing information when vivid memory is recalled, significantly influencing tourists' decision-making. The connection between vivid memory and behavioral intention is vital to understanding how past experiences shape future decisions and actions (Ittamalla & Srinivas Kumar, 2021). Based on this statement, the following hypothesis can be proposed:

H4: Vivid memory mediates the relationship between environmental attributes and tourists’ behavioral intentions.

Figure 1. Research Model



[Source : Processed data, 2024]

3. Research Methods

This study employs a quantitative causal research approach aimed at demonstrating the cause-and-effect relationship between the independent variable, environmental attributes, and the dependent variable, behavioral intention, with vivid memory serving as the mediating variable. The population for this research comprises international tourists visiting Likupang and Manado. The study adopts a non-probability sampling method using judgment (purposive) sampling, where the sample is selected based on subjective factors or the researcher’s assessment. The minimum sample size is determined based on 5-10 times the number of research indicators. With 12 questions in this study, the sample size is set at

60-120 respondents. The sample was selected based on specific criteria, including international tourists who had stayed for at least one day, visited Likupang or Manado within the past year, and were at least 17 years old. The research questionnaire was distributed both onsite and online using Google Forms in English and Mandarin. Respondents received the questionnaire via link, QR code, PDF, or physical copies.

The distribution of onsite questionnaires was conducted over three days in Manado and Likupang, from August 30 to September 1. Several destinations visited during the survey included Megamas Manado, Manado Scuba, Paal Beach, and Pulisan Beach. Meanwhile, the online distribution was conducted through direct messages to social media accounts on Instagram and TikTok of tourists who had visited Manado and Likupang. The study utilized a Likert scale for data collection through questionnaires, with interval categories ranging from 1 to 7, where 1 represented "strongly disagree" and 7 represented "strongly agree." The research indicators were pre-tested for validity and reliability on 38 respondents before being distributed to the remaining respondent. The validity and reliability tests were conducted using Cronbach's alpha and Pearson correlation, with the results confirming that the indicators were valid and reliable. The data analysis method employed a Structural Equation Modeling (SEM) approach using Partial Least Squares (PLS).

4. Research Findings and Discussion

4.1. Respons Characteristics

This study involved 140 respondents, obtained through both onsite and offline methods, with approximately 50.7% of them being female foreign tourists. The majority of respondents fell within the age range of 22–30 years (37.1%). In terms of nationality, most respondents were from Asian countries (52.7%), with the majority being Chinese citizens (29.3%) visiting Manado or Likupang. Regarding occupational background, 33.6% of respondents were employed as company staff. The primary purpose of their visit to Manado or Likupang was for leisure (70%), with an average travel duration of more than one week or up to one month (49.3%). In terms of travel companions, 40.7% of respondents traveled with family, while 33.6% traveled with friends. A significant portion of respondents (45.7%) had visited Indonesia two to three times in the past five years. Additionally, 44.3% of respondents visited Manado and Likupang for nature and wildlife-related activities, aligning with the study's focus on the sustainability of environmental attributes in these destinations.

Table 1. Structural Model Assessment

Variable & Indicator	Cronbach's α	AVE (%)
Environmental Attribute (Mean= 5.455 Std= 1.375)	0.763	0.58
EA2 Likupang or Manado has a clean environment		
EA4 The level of pollution in Likupang or Manado are acceptable		
EA5 Likupang or Manado is concerned with the preservation of natural areas		
EA6 Likupang or Manado has pleasant weather and climate		
Vivid Memory (Mean= 5.893 Std= 1.056)	0.543	0.52
VM1 Tourists can clearly recall what I saw in the Likupang or Manado		
VM2 Tourists can remember clearly layout or environment when visiting Likupang or Manado		
VM4 Tourists can remember clearly what heard when visiting Likupang or Manado		
Behavior Intention (Mean= 6.084 Std= 1.140)	0.777	0.52
BI1 Tourists will come back to Likupang or Manado in the future		
BI2 Tourists plan to visit other tourist destinations in Indonesia		
BI3 Tourists will recommend Likupang or Manado to others		
BI4 Tourists will talk positively about Likupang or Manado to others		
BI5 Tourists will share positive experiences about Likupang or Manado on social media		

The descriptive analysis results show that the mean values of all the 12 indicators are high, indicating respondent agreement, where the average values of the examined indicators are as follows : 5.455 for environmental attributes ; 5.893 for vivid memory ; and 6.084 for behaviour intention. The outer model evaluation on this study focuses on 2 calculations-convergent validity test and discriminant validity test. Convergent validity is measured through the calculation of factor loadings, composite reliability (CR), Cronbach’s alpha, and average variance extracted (AVE). Factor loadings assess the strength of indicators in measuring latent constructs, with values ≥ 0.70 considered strong and 0.50–0.70 acceptable but less ideal. Convergent validity is evaluated using AVE (>0.50), while reliability is tested through Cronbach’s Alpha (>0.60) and CR (>0.70). In this study, the 12 indicators show results that meet the factor loadings criteria with values ranging from 0.5 to 0.7 and the AVE value for all of the variables shows more than 0.5. Based on the results obtained, 6 observational indicators were removed due to low factor loadings and AVE values.

Table 2. Discriminant Validity

Variable	Fornell-Larcker Criterion			HTMT Ratio		
	(1)	(2)	(3)	(1)	(2)	(3)
(1) Environmental Attribute	0.762					
(2) Behavior Intention	0.378	0.725		0.444		
(3) Vivid Memory	0.492	0.366	0.721	0.708	0.522	

The Discriminant validity test, indicates that an indicator can be considered valid if the correlation value of the variable with itself is greater than the correlation value with other variables and being measured through Fornell-larcker criterion and Heterotrait-monotrait ratio (HTMT). Based on the table, the Fornell-Larcker values of each variable are higher with its own value compared to other variables. Therefore, all variables can be considered valid in terms of discriminant validity. Additionally, all HTMT values of the variables are less than 0.90, indicating that the variables being tested are sufficiently distinct from each other, and confirming that discriminant validity has been achieved.

Table 3. R-square result

Variable	R ² (R-square)
Behavior Intention	0.186
Vivid Memory	0.242

The R-square coefficient value ranges from 0 to 1, meaning that the higher the value, the more reliable the indicator (Hair et al., 2019). The test results show that the R-square value for the behavioral intention variable is 0.186, indicating that tourists' behavioral intention is influenced by environmental attributes by 18.6%. Furthermore, environmental attributes influence vivid memory by 24.2%.

Table 4. Hypothesis test result

Hypothesis	Original Sample	T statistics	P values	Description
H ₁ : Environmental Attribute → Behavior Intention	0.261	2.039	0.042	Accepted
H ₂ : Environmental Attribute → Vivid Memory	0.492	6.109	0.000	Accepted
H ₃ : Vivid Memory → Behavior Intention	0.238	2.075	0.038	Accepted
H ₄ : Environmental Attribute → Vivid Memory → Behavior Intention	0.133	0.064	0.068	Accepted

The path coefficient results indicate that environmental attributes have a positive influence on behavioral intention and vivid memory. This is supported by the original sample value of environmental attributes on behavioral intention (0.261), with a t-statistic of 2.039 (>1.96) and a p-value of 0.042 (<0.05). The effect of environmental attributes on vivid memory, with a t-statistic of 6.109 (>1.96) and a p-value of 0.000, confirms a significant relationship between variables. The influence of vivid memory on behavioral intention is also supported, indicating a significant effect. In this study, the researcher

applied a significance level of 0.10 (Hair et al., 2019) for p-values in the mediation effect, confirming the significant influence of environmental attributes on vivid memory and its impact on tourists' behavioral intentions.

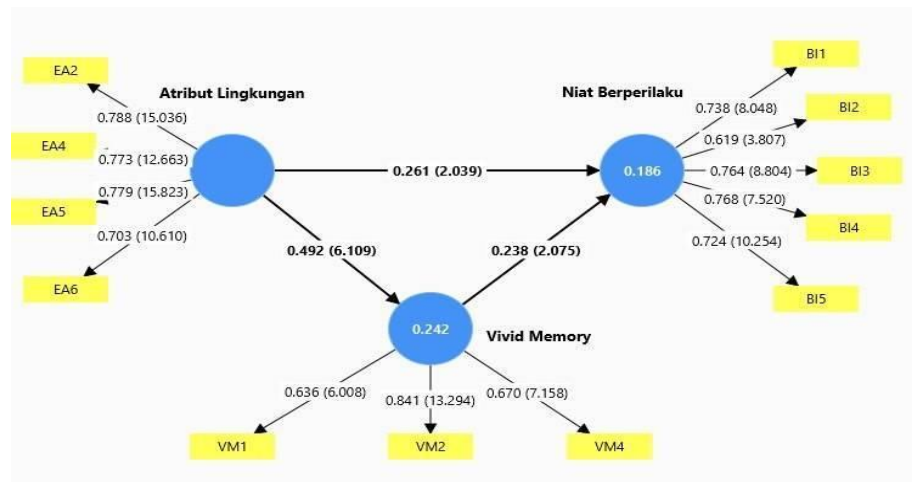


Figure 2. Path analysis result
[Source : Processed data, 2024]

4.2. Discussion

The analysis results of this study indicate that environmental attributes significantly influence vivid memory through factors such as cleanliness, environmental pollution, environmental protection and conservation, as well as climate conditions in Likupang and Manado. This aligns with the study by Zhao et al. (2022), which suggests that positive experiences enhance tourists' memory of a destination. When tourists have a good experience, they tend to recall their travel experiences more clearly. Environmental attributes based on sustainable tourism have an impact on tourists' behavioral intentions, although not significantly. This finding is consistent with the study by Thipsingh et al. (2022), which states that sustainability practices influence tourists' behavioral intentions.

In the environmental attributes variable, the indicator of a clean and orderly environment (EA2) obtained the highest factor loadings, indicating that this indicator is a strong and credible representation of environmental attributes. This finding aligns with the research context, as Likupang and Manado's marine tourism destinations are well-maintained in terms of cleanliness and orderliness. For the vivid memory variable, the highest score was observed in tourists' recollection of spatial arrangements and the environment when visiting Likupang and Manado. This is consistent with the study's focus on the natural environment of these destinations. In environmental tourism, natural beauty and travel experiences engage multiple senses (visual, auditory, and tactile). Spatial arrangements, in particular, can be recalled by tourists through sensory perception, especially vision, which stimulates sensory memory and transfers it to long-term memory (Zhao et al., 2022).

The role of vivid memory as a mediator indicates a relatively small influence. Despite its minor effect, the mediation of vivid memory between environmental attributes and tourists' behavioral intentions remains acceptable. This finding is particularly relevant for social and exploratory research, where complex variables and external factors may influence respondents' responses. Research on vivid memory in relation to environmental attributes is still limited, leading to unstable indicators. Therefore, further studies are needed to establish more stable and significant indicators. Referring to the hypothesis test results, the path coefficient value (0.042) suggests that environmental attributes can have a direct effect on tourists' behavioral intentions.

In this study, the R-square coefficient value was relatively low, indicating that factors beyond environmental attributes may influence the relationships between variables, particularly in the tourism context. Factors such as personal experiences or the quality of experiences can evoke emotional responses and provide social and psychological benefits, which in turn affect the clarity of tourists' memories. Vivid memory and behavioral intention are inherently complex and subjective, making them difficult to define solely based on environmental attributes. These factors cannot always be accurately measured or predicted, as respondents have diverse experiences and reactions, influencing how they recall their travel experiences (Hari et al., 2019).

Other factors influencing the R-square value, as suggested by Câmara et al. (2023) and Ittamalla & Kumar (2019), indicate that vivid memory must be reinforced by an individual's emotional aspects. Emotional engagement fosters a stronger connection between tourists and the destination, making experiences more personal and, therefore, more easily and vividly recalled. Ittamalla & Kumar (2019), Kim (2022), and Juliana et al. (2023) further explain that active participation in tourism activities enhances tourists' ability to remember events.

In relation to environmental attributes and vivid memory, activities involving direct interaction with nature such as snorkeling, scuba diving, rafting, and other outdoor experiences can strengthen tourists' vivid memory of environmental attributes in Likupang and Manado. This suggests that vivid memory alone is not a perfect mediating variable and must be supported by other factors, such as emotional responses and direct interaction with the environment. Additionally, external variables like the timing of visits may influence the indirect effect, as visiting during peak seasons can impact emotional experiences both positively and negatively (Juliana et al., 2023).

Differences in human brain function during memory formation can also influence the R-square value of this study. Research by Sridhar et al. (2023) and Amin & Malik (2013) suggests that variations in brain structure contribute to individual differences in memory formation. Additionally, brain structure differs by gender, with variations in regions such as the amygdala and hippocampus affecting how individuals create and recall memories. Furthermore, Wei et al. (2019) found that age impacts how the brain retains memories. Adults tend to have a more organized and stable memory capacity, making them more selective in preserving certain experiences. These neurological differences highlight the complexity of memory formation and its influence on research findings related to vivid memory and environmental attributes. Memory formation is divided into three stages: the encoding process, retention, and recall. Sridhar et al. (2023) explain that recalling an event involves accessing, selecting, and reactivating stored memories, a process influenced by external sensory stimuli such as visual, olfactory, and auditory inputs. Amin & Malik (2013) found that the brain processes different types of stimuli in distinct ways, affecting the clarity of memories formed and recalled. Furthermore, Sridhar et al. (2023) emphasize that memory is dynamic when reactivated, it becomes vulnerable and can be modified by other memories. This study indicates that when tourists recall their travel experiences, external stimuli can influence the clarity of their memories, highlighting the complex and fluid nature of memory formation in the tourism context.

The first objective of this study is to determine the significance of the influence of environmental attributes on the behavioral intentions of international tourists. The path coefficient data (original sample) and significance level (p-values) indicate that the relationship between these variables is acceptable. A path coefficient value of 0.261 suggests the strength, direction, and impact of this relationship, with a positive value indicating a favorable effect on behavioral intentions. The p-value of 0.042 confirms the statistical significance of this influence, suggesting a low probability that the observed relationship occurred by chance. Respondent data further reveal that 44.3% of international tourists visit Manado and Likupang for nature and wildlife activities, seeking natural tourism experiences that encourage positive behavioral intentions. Addressing the second research objective, this study confirms a significant relationship between environmental attributes and vivid memory, as indicated by a t-statistic value of 6.109 and a p-value of 0.00. This finding aligns with Zhao et al. (2022), who demonstrated that natural tourism destinations create memorable experiences that contribute to vivid memory formation. In the case of Likupang and Manado, factors such as a clean natural

environment, comfortable climate, and low pollution enhance the quality of tourist experiences, leaving a lasting impression stored in long-term memory.

Furthermore, the study findings indicate that vivid memory significantly influences tourists' behavioral intentions in these destinations, addressing the third research objective. These results support the study by Kim et al. (2022), which found that vivid memory plays a role in shaping tourists' intentions to revisit a destination or explore other locations in Indonesia. The fourth research objective aims to assess the significance of vivid memory as a mediating variable between environmental attributes and tourists' behavioral intentions. In psychological studies, an indirect effect p-value of 0.068 is considered marginally significant (Collentine et al., 2019). This suggests that vivid memory does not fully mediate this relationship but still plays a partial role.

Schacter (2022) and Liebherr et al. (2020) explain that external aids, such as the use of technology and social media, impact an individual's ability to manage and recall information more efficiently and effectively. These aids allow individuals to store some of their information externally, reducing the burden on internal memory. In the context of tourism, this research suggests that the use of technology, such as travel documentation, helps tourists better recall their experiences at a particular destination. However, technology can also impair internal memory by fostering dependence on external tools, which may reduce brain capacity and impair cognitive function related to remembering or storing information (Schacter, 2022; Liebherr et al., 2020).

5. Conclusions

This study concludes that environmental attributes have a positive relationship with vivid memory and influence tourists' behavioral intentions. The stronger and clearer the memories formed during the travel experience, the higher the tourists' attachment to the destination. Consequently, this increases their intention to revisit or recommend the destination to others (Zhao et al., 2022). This study aims to examine the significance of environmental attributes in influencing the formation of vivid memories and tourists' behavioral intentions in Indonesia's tourism sector. One key indicator evaluated by tourists regarding environmental attributes is cleanliness and orderliness, as well as the attention of local communities and stakeholders to the preservation of natural areas in Likupang and Manado.

In addition to a well-maintained and attractive environmental ecosystem, developing diverse and high-quality facilities around tourist destinations is essential to enhance tourist appeal in Manado and Likupang (Gu et al., 2022). Direct observations by researchers indicate differences between Manado and Likupang, where Manado has better infrastructure and accessibility, while the implementation of the super-priority destination development program in Likupang has not been effectively realized. Several facilities and activities can be developed to attract more tourists, facilitated by the government or private sector. These include improving accommodations around Likupang and offering activities such as snorkeling, diving, glass-bottom boat tours, and fishing tours. Beyond water activities, other experiences can be enhanced, such as visiting villages and hills in Likupang, exploring mangrove forests, and observing diverse flora and fauna, including various seabirds in Baho Village. Additionally, engaging tourists in social interactions with local communities can provide a deeper cultural experience in Likupang and Manado.

The findings of this study provide managerial implications for local governments and tourism destination managers in Likupang to develop marketing strategies focused on sustainable tourism. This can be achieved by leveraging the area's natural authenticity, maintaining cleanliness, and enhancing environmental quality, including both the marine ecosystem and the surrounding tourist areas.

Some limitations in this study include the suggestion for future research to add other variables or indicators that can mediate the relationship between environmental attributes and tourists' behavioral intentions. This would help make the mediation variables more consistent/stable in measuring the relationship between independent and dependent variables, such as exploring emotional or sensory factors experienced by tourists during their visits, as well as considering the influence of external factors like technology. Furthermore, it is suggested to not only measure environmental attribute variables but

also use independent variables that incorporate other sustainability elements from the triple bottom line, such as economic and social factors, to enhance the tourist experience and make it more memorable and vivid for tourists.

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