**Timor-Leste Journal of Business and Management**

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

# The Influence of Ecotourism Activity on Environmental Conservation through visitors Awareness at Mangrove Hera Park, Dili, Timor-Leste.

**Emilia Freitas Pereira, Rachel Silva da Costa, Estanislau de Sousa Saldanha, Agustinus Nahak Seran**
*Tour and Travel Management, School of Tourism and Hospitality Management, Dili Institute of Technology (DIT), Dili, Timor-Leste*
*Graduate School, Dili Institute of Technology, (DIT), Dili, Timor-Leste*
*Email: fremilzoe@gmail.com; rachelsilvacos@gmail.com;estanislausaldanha@yahoo.com; agustinusnahakbali@gmail.com*

**ABSTRACT**

This study explores the influence of ecotourism activities on environmental conservation, with a specific focus on the mediating role of visitors' awareness in the context of Mangrove Hera Park, Dili, Timor-Leste. Utilizing a quantitative research methodology, data were collected from 133 park visitors through a structured questionnaire. The analysis was conducted using Structural Equation Modeling (SEM) with the aid of SMART-PLS software. The findings reveal that ecotourism activities significantly enhance visitors' awareness, which subsequently exerts a positive impact on environmental conservation efforts. These results underscore the critical role of incorporating educational components into ecotourism initiatives to promote sustainable behaviors and support local conservation endeavors. The study offers practical recommendations for policymakers and tourism practitioners, emphasizing the development of sustainable tourism strategies that prioritize community engagement and environmental stewardship.

***Keywords***: *Ecotourism, Environmental Conservation, Visitor Awareness, Sustainable Tourism, Timor-Leste.*

## 1. Introduction

Ecotourism has emerged as a transformative model within sustainable tourism, aligning economic development objectives with the critical goals of environmental preservation and cultural heritage protection. The International Ecotourism Society (TIES) defines Ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people" (TIES, 2015). This definition underscores Ecotourism's dual role: promoting environmental stewardship and fostering socio-economic benefits for host communities. As a result, Ecotourism has increasingly been recognized as a catalyst for biodiversity conservation, environmental awareness, and the empowerment of local communities (Ali et al., 2023; Lim & McAleer, 2023).

The sector appeals to a growing demographic of travelers who prioritize environmental responsibility and cultural authenticity, thus challenging tourism developers to innovate sustainable tourism models that meet these expectations without compromising ecological or cultural integrity (Liu & Wang, 2023). Research indicates that Ecotourism often generates positive environmental outcomes by educating tourists on conservation practices and sustainable behaviors, which can encourage a more conscientious approach to travel (Su et al., 2022; García-Rosell et al., 2023). However, while Ecotourism has shown promise, its effectiveness is heavily influenced by tourists' levels of environmental awareness and their willingness to engage in conservation-supportive practices (Wang et al., 2023; Ballantyne & Packer, 2016).

While existing research has predominantly highlighted Ecotourism's economic and cultural benefits, there is an increasing recognition of its potential to influence environmental conservation directly. Ecotourism can act as an educational tool, fostering ecological awareness among visitors and encouraging behaviors that contribute to local environmental protection efforts (Su & Swanson, 2022; Kim et al., 2022). Nonetheless, the extent to which ecotourism activities foster a genuine commitment to conservation still needs to be explored, particularly in emerging ecotourism destinations such as Timor-Leste. Mangrove Hera Park, an ecotourism site known for its biodiversity and cultural significance, presents a valuable case for examining how structured ecotourism activities can foster visitor awareness and support conservation goals.

Addressing this gap, the current study aims to evaluate the role of ecotourism activities at Mangrove Hera Park in promoting environmental conservation, explicitly focusing on visitor awareness as a mediating factor. Visitor awareness is a crucial component in this relationship, as studies suggest that informed and engaged tourists are more likely to adopt conservation-minded behaviors that align with Ecotourism's sustainability objectives (Wong et al., 2023; Ma et al., 2023). By understanding how ecotourism activities enhance environmental awareness, this research will provide insights into how Ecotourism can achieve both ecological and educational objectives.

The objectives of this study are to evaluate the influence of ecotourism activities on environmental conservation at Mangrove Hera Park, to assess the role of visitor awareness in supporting conservation initiatives, and to examine the mediating effect of visitor awareness on the relationship between ecotourism activities and environmental conservation. This focus is especially relevant as it sheds light on Ecotourism's capacity to contribute to

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

environmental Sustainability while advancing socio-economic benefits for local communities in developing regions like Timor-Leste. By clarifying these relationships, the study seeks to provide actionable insights for policymakers, ecotourism practitioners, and local communities fostering sustainable tourism.

## 2. Theoretical Frameworks and Hypotheses

### 2.1. Conceptual Approach

#### 2.1.1. Ecotourism Activities

Ecotourism activities cover a range of immersive, nature-centered experiences to foster an appreciation for natural ecosystems among tourists. These activities include wildlife observation, conservation-centered educational tours, and interactive cultural engagements designed to create a meaningful connection between visitors and the natural environment, thereby instilling conservation values (Pizam, 2021). Research suggests that Ecotourism can encourage sustainable behaviors by engaging tourists in activities that expose them to the beauty of natural spaces and emphasize the importance of protecting these environments (Lai & Nepal, 2020). Furthermore, Ecotourism's impact is greatly enhanced when it actively involves local communities. This collaborative approach provides an economic boost for the local population and aligns community goals with conservation objectives, creating a mutually reinforcing system that benefits both environmental and social dimensions (Ma et al., 2023; Razzaq et al., 2022). As community involvement in Ecotourism strengthens, the activities increasingly reflect the host community's cultural values and conservation priorities, rendering conservation efforts more effective and sustainable (Ali et al., 2023).

#### 2.1.2. Visitor Awareness

Visitor awareness, or the extent of tourists' understanding and consciousness regarding environmental issues, is a critical component of Ecotourism. Awareness among tourists can significantly influence their behavior, motivating them to support conservation practices during and even after their visit (García-Rosell et al., 2023). Educational elements embedded in ecotourism activities play a vital role in nurturing this awareness, as they help shape visitors' attitudes toward environmental stewardship and encourage actions that positively contribute to conservation efforts (Su & Swanson, 2022; Kim et al., 2022). Researchers argue that enhanced awareness among ecotourists strengthens their conservation values, prompting them to support and engage in sustainable practices that protect natural resources (Wong et al., 2023). This shift in mindset can transform visitors into long-term advocates for environmental conservation, influencing not only their behaviors but also those of others within their social networks (Ballantyne & Packer, 2016). Thus, cultivating awareness among ecotourists has immediate and potentially lasting effects, extending the benefits of Ecotourism beyond individual experiences to broader, global conservation efforts (Kim et al., 2022).

#### 2.1.3. Environmental Conservation

In Ecotourism, environmental conservation refers to strategies focused on safeguarding biodiversity, preserving natural habitats, and sustainably managing resources. Conservation objectives are best achieved when local communities and visitors actively participate in conservation-oriented activities (Gossling & Buckley, 2021). Studies show that visitors who understand the ecological significance of natural areas are more likely to engage in practices that contribute to environmental preservation (Boley et al., 2021). Conservation education within ecotourism contexts has become increasingly valued for promoting responsible tourism that aligns with biodiversity protection goals (Moore et al., 2023). Effective ecotourism initiatives, therefore, serve as tools for both environmental education and the encouragement of responsible behavior, which contributes to the protection of natural resources and fosters a broader conservation ethic (Ali et al., 2023).

### 2.2. Theoretical Justification and Hypotheses Development

#### 2.2.1. Ecotourism and environmental conservation

Ecotourism activities are strategically designed to minimize tourism's ecological footprint by encouraging visitors to adopt behaviors supportive of conservation, such as minimizing waste, respecting ecological boundaries, and participating in habitat preservation efforts (Wong et al., 2023). Research indicates that when tourists engage actively in these conservation activities, they contribute to environmental preservation and help local communities economically (Ali et al., 2023). When ecotourism activities prioritize environmental protection, they reinforce tourists' roles as advocates for Sustainability, further advancing conservation goals (Lim & McAleer, 2023). Based on these insights, it is hypothesized that ecotourism activities directly contribute positively to environmental conservation.

*H1: Ecotourism activities positively and significantly influence environmental conservation.*

#### 2.2.2. Ecotourism Activities and Influence Visitors' Awareness

Visitor awareness is essential to the long-term success of Ecotourism in promoting conservation, as it encourages tourists to adopt sustainable behaviors that align with conservation goals. Studies suggest that ecotourism activities effectively raise visitors' awareness of environmental issues, leading to enduring shifts in their attitudes and behaviors (Ballantyne & Packer, 2016; Su & Swanson, 2022). By

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

integrating education into ecotourism experiences, visitors are informed about conservation issues and empowered to understand the necessity of sustainable practices (Wong et al., 2023). The educational components within ecotourism activities have proven effective in fostering environmental awareness and sustainable behaviors, forming the basis for hypothesizing that ecotourism activities positively influence visitor awareness (García-Rosell et al., 2023).

*H2: Ecotourism activities positively and significantly influence visitors' awareness.*

#### 2.2.3. Visitors' Awareness and Environmental Conservation

Enhanced environmental awareness among tourists is associated with more robust support for conservation initiatives. Research shows that awareness influences tourists' behavior and reinforces their conservation values, often extending beyond the immediate ecotourism experience (Ali et al., 2023). Heightened awareness tends to result in more active participation in conservation activities, thus contributing to environmental preservation efforts (Su et al., 2022). For instance, tourists who understand the environmental impact of their actions are more likely to follow conservation guidelines, reduce their ecological footprint, and support organizations focused on environmental protection. Consequently, this study hypothesizes that visitor awareness positively affects environmental conservation (Kim et al., 2022; Wong et al., 2023).

*H3: Visitors' awareness positively and significantly influences environmental conservation.*

#### 2.2.4. Ecotourism activities, Visitor Awareness, and Environmental Conservation

Studies suggest that Ecotourism can indirectly support conservation by raising visitor awareness and encouraging conservation-supportive behaviors (Ballantyne & Packer, 2016; Wong et al., 2023). Incorporating educational components into ecotourism activities allows visitor awareness to serve as a link between ecotourism involvement and conservation outcomes (Ma et al., 2023). This mediating effect implies that awareness is a catalyst, transforming ecotourism engagement into conservation actions. Research supports this perspective, indicating that when visitors are educated on conservation issues, their behaviors and attitudes align more closely with environmental protection goals (García-Rosell et al., 2023).

*H4: Visitor awareness mediates the relationship between ecotourism activities and environmental conservation.*

## 3. Research Method

### 3.1. Research Design

This study adopts a quantitative research design, an approach well-suited for analyzing relationships between variables and allowing for systematic and objective data measurement (Creswell & Creswell, 2018). The quantitative approach was selected to examine the influence of ecotourism activities on environmental conservation, with visitor awareness functioning as a mediating variable. By focusing on measurable data, this design enables the precise testing of the hypothesized relationships, ensuring that the conclusions drawn are statistically valid (Saunders et al., 2019). Data were collected via a Likert-scale questionnaire administered to tourists and local community members visiting Mangrove Hera Park between August 5 and August 9, 2024. The Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), is effective in capturing subjective perceptions in a structured manner, facilitating the quantification and subsequent analysis of attitudes (Joshi et al., 2015).

### 3.2. Population and Sampling

The target population consisted of all individuals visiting Mangrove Hera Park, a site recognized for its biodiversity and cultural heritage. Due to the nature of the study, an incidental sampling method, also known as convenience sampling, was employed. This non-probabilistic approach is commonly used when random sampling may be challenging or impractical, especially in exploratory research where accessibility is a priority (Etikan et al., 2016). One hundred thirty-three respondents were recruited based on their availability and willingness to participate during the data collection period. Although convenience sampling may limit the generalizability of findings, it allows for efficient data collection in high-turnover settings, such as ecotourism sites with transient visitor populations (Etikan et al., 2016). The sample size of 133 is deemed sufficient, as research by Hair et al. (2019) suggests that sample sizes exceeding 100 are generally reliable for structural equation modeling (SEM), especially in exploratory contexts.

Respondents were asked to rate statements about ecotourism activities, visitor awareness, and environmental conservation using a 5-point Likert scale. This scale is advantageous in quantifying attitudes and perceptions, enabling nuanced analysis across different levels of agreement (Joshi et al., 2015).

### 3.3. Variable Measurement

To ensure accurate measurement, the study's variables were operationalized through carefully chosen indicators, each designed to capture the theoretical dimensions of the constructs. This approach enhances the reliability and validity of the study, aligning with established practices in

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

quantitative research (Hair et al., 2019). Ecotourism Activities (EA): This independent variable was measured through indicators reflecting the multifaceted impacts of ecotourism activities, including environmental impact, visitor education, socio-cultural improvement, and economic benefits. These dimensions align with research indicating that Ecotourism can foster conservation and development when these components are emphasized (Buckley, 2020).

Visitor Awareness (VA): Serving as the mediating variable, visitor awareness was assessed through indicators of environmental knowledge, behavior, adherence to conservation rules, and engagement in conservation activities. These indicators encapsulate both cognitive and behavioral aspects of awareness, which are crucial for fostering a pro-environmental mindset among tourists (Ballantyne & Packer, 2016).

Environmental Conservation (EC): As the dependent variable, environmental conservation was evaluated through indicators such as habitat protection, biodiversity monitoring, and water management. These indicators reflect core conservation principles, emphasizing Ecotourism's potential role in preserving ecological integrity (Gossling & Buckley, 2021).

### 3.4. Data Collection Techniques

Primary data were collected directly from visitors and local community members through structured questionnaires designed to gauge perceptions of Ecotourism's impact on environmental conservation mediated by visitor awareness. Structured questionnaires are highly effective in social science research as they provide consistency in responses and enable comparisons across a large sample, enhancing the reliability of the findings (Saunders et al., 2019).

Each item on the questionnaire was formulated to target specific dimensions of ecotourism activities, visitor awareness, and environmental conservation. A preliminary pre-test was conducted with a small group to ensure clarity and relevance of questions, and modifications were made based on feedback to optimize reliability and validity. This process ensures that data collection directly captures the perspectives of individuals experiencing or impacted by Ecotourism at Mangrove Hera Park, thereby adding to the authenticity and contextual relevance of the study's findings (Creswell & Creswell, 2018).

### 3.5. Data Analysis Techniques

Data analysis was conducted using SMART-PLS 3.0 (Partial Least Squares Structural Equation Modeling), a powerful tool in social science research for handling complex models with multiple relationships and latent constructs. SMART-PLS is particularly suitable for exploratory studies, as it is adept at modeling indirectly observable constructs, which aligns with the goals of understanding how ecotourism activities influence environmental conservation via visitor awareness (Ringle et al., 2015). Additionally, PLS-SEM is highly recommended for studies with moderate sample sizes, making it an ideal choice for this study (Hair et al., 2019).

Validity was evaluated using the Fornell-Larcker Criterion to confirm discriminant validity, which ensures that each construct is distinct and does not capture overlapping dimensions. Discriminant validity is critical for confirming that the variables measure unique elements of the research framework (Hair et al., 2019). Convergent validity was assessed through the Average Variance Extracted (AVE), with values above 0.50 demonstrating that a construct explains more than half of the variance in its indicators, affirming its convergent validity (Henseler et al., 2015).

Construct reliability was assessed through Cronbach's Alpha and Composite Reliability (CR) metrics, which measure internal consistency. Reliability is deemed acceptable when Cronbach's Alpha and CR values exceed 0.70, indicating that the indicators are stable and consistently reflect their respective constructs (Hair et al., 2019).

Path Analysis and Hypothesis Testing: Finally, path analysis was conducted to assess the hypothesized relationships among ecotourism activities, visitor awareness, and environmental conservation. The analysis specifically examined the direct effects of ecotourism activities on environmental conservation and visitor awareness and the mediating effect of visitor awareness on the relationship between ecotourism activities and environmental conservation. Path coefficients, T-statistics, and P-values were calculated to determine the strength and significance of these relationships. P-values below 0.05 indicate statistically significant relationships, confirming or refuting the study's hypotheses (Ringle et al., 2015).

By adopting a rigorous, structured approach to data analysis, this study ensures the validity and reliability of its findings, contributing meaningful insights into the relationships among ecotourism activities, visitor awareness, and environmental conservation within the context of Mangrove Hera Park. This methodological rigor supports the study's aim of providing evidence-based recommendations for enhancing Ecotourism's role in promoting environmental stewardship.

## 4. Result and Discussion

### 4.1. Results of Validity and Reliability Test

To ensure the accuracy and reliability of the constructs in this study, comprehensive validity and reliability assessments were conducted before testing the hypothesized relationships. This approach aligns with rigorous standards for structural equation modeling, as recommended in quantitative research.

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

Convergent Validity: Convergent validity was established through outer loading (OL) with values above the threshold values of 0.7 (Figure 2), and the Average Variance Extracted (AVE) values, with all constructs achieving AVE scores above the 0.50 threshold (indicated in Table II), as suggested by Hair et al. (2019). This indicates that the constructs explain more than half of the variance in their indicators, confirming the validity of the constructs and supporting the notion that each item effectively represents its respective construct. High convergent validity reinforces the trustworthiness of these measures in capturing the intended variables (Fornell & Larcker, 1981).

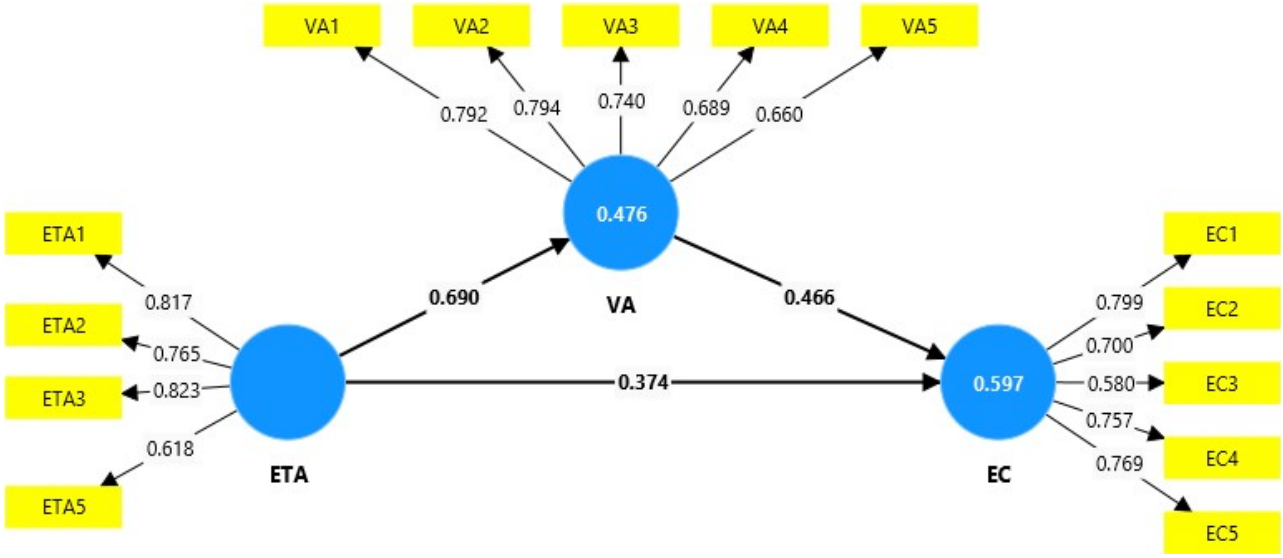


Figure 1. Outer Loading (OL) for Convergent Validity

Discriminant validity was confirmed using the Fornell-Larcker Criterion, which demonstrated that the square root of each construct's AVE was higher than the correlations with other constructs. This suggests that each construct is distinct, with minimal overlap, supporting the uniqueness of each measured variable (Hair et al., 2014; Henseler et al., 2015). Ensuring discriminant validity is critical in reducing multicollinearity issues and capturing the nuanced relationships among the constructs.

Table I. Fornell-Larcker for Discriminant Validity Test

| Item | EC | ETA | VA |
|---|---|---|---|
| EC | 0.725 | | |
| ETA | 0.695 | 0.760 | |
| VA | 0.724 | 0.690 | 0.737 |

Reliability: Reliability was assessed using Cronbach's Alpha and Composite Reliability (CR) values, which exceeded the 0.70 threshold for all constructs, further indicating internal solid consistency (Hair et al., 2019). This consistency ensures that the items within each construct work together cohesively, reliably capturing the variables intended for the study. High-reliability scores provide confidence in the stability of these constructs, supporting their suitability for further analysis and hypothesis testing.

Table II. Values of CA and CR for Reliability Test, and AVE for Convergent Validity Test

| Item | Cronbach's alpha (CA) | Composite reliability (CR) | Average variance extracted (AVE) |
|---|---|---|---|
| EC | 0.772 | 0.790 | 0.526 |
| ETA | 0.755 | 0.786 | 0.578 |
| VA | 0.790 | 0.806 | 0.543 |

### 4.2 Results of Hypothesis Testing and Discussion

Following establishing validity and reliability, path analysis was conducted to test each hypothesis within the research model. Each hypothesis is examined in detail, emphasizing statistical outcomes and alignment with or divergence from prior research.

#### 4.2.1 Ecotourism Activities and Environmental Conservation

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

The path analysis reveals a positive and statistically significant relationship between ecotourism activities and environmental conservation (T = 7.692, p = 0.000) (as indicated in Table III), supporting Hypothesis 1. This result underscores the role of Ecotourism in advancing conservation goals, reinforcing the insights from recent studies that highlight Ecotourism's contributions to environmental preservation.

Table III. Values of Path Coefficient (T and P values) for Hypothesis Test

| | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values | Description |
|---|---|---|---|---|---|---|
| ETA -> EC | 0.374 | 0.377 | 0.049 | 7.692 | 0.000 | Significant |
| ETA -> VA | 0.690 | 0.692 | 0.032 | 21.609 | 0.000 | Significant |
| VA -> EC | 0.466 | 0.464 | 0.052 | 8.979 | 0.000 | Significant |
| ETA -> VA -> EC | 0.321 | 0.321 | 0.039 | 8.280 | 0.000 | Significant |

For instance, Wong et al. (2023) and Lim and McAleer (2023) demonstrated that ecotourism initiatives, particularly those involving structured conservation activities, contribute to environmental stewardship by fostering behaviors like habitat protection, biodiversity monitoring, and waste reduction among visitors. The alignment of these findings with previous research underscores the importance of well-designed Ecotourism as a sustainable approach that actively engages tourists in protecting ecological resources and maintaining biodiversity.

The statistical strength of this relationship, indicated by a T-value of 7.692, highlights the efficacy of Ecotourism in fostering environmental awareness and responsible behaviors. Such a robust result suggests that ecotourism activities have substantial potential for supporting conservation goals by transforming visitors into advocates of Sustainability (Ali et al., 2023). Nevertheless, contrasting viewpoints are present in the literature. For example, Xue et al. (2020) caution that without regulation, Ecotourism can inadvertently lead to environmental degradation, significantly when visitor numbers surpass the area's ecological capacity. This situation can result in resource depletion and habitat damage, highlighting that Ecotourism's benefits are not universally guaranteed.

Similarly, Liu and Wang (2023) found that the positive impacts of Ecotourism on conservation are often conditional upon the presence of effective management and visitor controls. These studies underscore the importance of managing Ecotourism sustainably, as unmanaged or excessive tourism can undermine ecological goals by introducing undue stress on natural environments. Consequently, visitor management and regulatory practices are essential to preserving the integrity of Ecotourism's conservation objectives.

This divergence in findings illustrates a critical need for sustainable visitor management within Ecotourism. Practical strategies include regulating visitor numbers, establishing designated observation areas, and implementing conservation-oriented programs. These strategies help prevent environmental stress, ensuring Ecotourism achieves its conservation goals without compromising natural resources (Buckley, 2022). By balancing visitor engagement with ecological preservation, Ecotourism can continue to serve as a valuable tool for conservation while offering educational and enriching experiences for tourists. Recent literature increasingly emphasizes this need for regulated Ecotourism as a means to protect environmental assets and ensure long-term Sustainability (Gössling & Buckley, 2021).

### 4.2.2. Ecotourism Activities and Visitor Awareness

The analysis revealed a positive and statistically significant influence of ecotourism activities on visitor awareness (T = 21.609, p = 0.000) (as indicated in Table III), supporting Hypothesis 2. This result suggests that ecotourism activities substantially elevate visitors' awareness of environmental issues, consistent with findings from Ballantyne & Packer (2016) and Su & Swanson (2022), who emphasize that Ecotourism's educational components—such as guided tours, conservation talks, and interactive workshops—are instrumental in fostering environmental awareness and understanding. This evidence underscores the role of Ecotourism as an educational platform that helps visitors grasp the significance of ecological preservation.

The high R-value of 21.609 highlights the statistical strength of this relationship and suggests that ecotourism activities are exceptionally effective in cultivating environmental consciousness among tourists. This aligns with Kim et al. (2022), who found that experiential learning through hands-on activities, such as wildlife observation and conservation workshops, prompts visitors to reflect deeply on their environmental impact, encouraging sustainable behaviors. Such interactive elements in Ecotourism provide an experiential dimension that enhances the learning process, allowing visitors to engage actively with conservation principles rather than passively absorbing information.

However, this positive impact on awareness is only sometimes assured. Studies like Wu et al. (2021) highlight that the environmental awareness gained during ecotourism experiences may fade unless reinforced. This finding points to the potential limitation of a one-time experience, suggesting that the heightened awareness of Ecotourism may only translate into lasting behavioral change with continued engagement. Xu et al. (2020) similarly note that while Ecotourism can initially raise awareness, the long-term retention of these values may require periodic reminders or continued educational interactions.

These findings underscore the importance of follow-up initiatives to maintain and deepen environmental awareness. Strategies such as post-visit digital engagement, periodic

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

newsletters, or virtual conservation updates could help reinforce the conservation values introduced during ecotourism experiences. As supported by Wong et al. (2023), integrating such post-visit efforts may sustain visitors' environmental awareness and encourage them to adopt and advocate for sustainable practices long after their visit.

Therefore, ecotourism activities have a substantial and positive impact on raising visitor awareness; enhancing the durability of this awareness remains a key challenge. Employing follow-up programs and interactive digital content can help bridge this gap, ensuring that the conservation messages and environmental consciousness fostered through Ecotourism persist over time, ultimately reinforcing Ecotourism's role as a tool for sustainable development and ecological advocacy. This nuanced approach to Ecotourism aligns with emerging perspectives in the field, which advocate for ongoing visitor engagement as essential to achieving sustainable and lasting conservation outcomes (Ali et al., 2023; Gossling & Buckley, 2021).

#### 4.2.3. Visitor Awareness and Environmental Conservation

The analysis demonstrated a positive and statistically significant relationship between visitor awareness and environmental conservation (T = 8.979, p = 0.000) (as indicated in Table III), supporting Hypothesis 3. This finding aligns with existing research suggesting that heightened environmental awareness among tourists promotes behaviors supportive of conservation efforts. As García-Rosell et al. (2023) note, informed tourists are more likely to adopt sustainable practices, actively contributing to conservation initiatives during and after their ecotourism experience. These behaviors, spurred by increased awareness, play a crucial role in sustaining conservation areas' ecological and social goals.

The T-value of 8.979 underscores the notable influence of awareness on conservation-oriented actions, reinforcing the idea that well-informed tourists are more inclined toward environmentally responsible behaviors, such as waste reduction, habitat protection, and respect for local biodiversity. This finding is further corroborated by Boley et al. (2021), who found that tourists with a sound understanding of environmental significance are more supportive of initiatives like habitat preservation and biodiversity monitoring. The emphasis on educating tourists to foster a conservation mindset aligns with broader literature, highlighting awareness as a foundational element in cultivating eco-friendly behaviors (Ali et al., 2023).

However, while increased awareness generally encourages conservation behaviors, there are nuanced perspectives. For example, Zhang and Zhang (2019) argue that awareness alone may only consistently translate into active conservation behaviors with additional motivational drivers, such as personal engagement, social incentives, or visible, short-term conservation outcomes. Their findings suggest that awareness is an essential precursor to conservation behaviors, but without personal motivation or incentives, tourists may not feel compelled to act on their knowledge. This aligns with theories of environmental psychology, which indicate that motivational factors must complement awareness to ensure sustained behavioral change (Gifford & Nilsson, 2014).

These insights highlight the potential benefit of integrating motivational strategies with awareness-raising efforts in ecotourism programs to amplify conservation outcomes. Visitor programs that include hands-on conservation activities, such as guided restoration efforts or community-led sustainability workshops, could enhance tourists' connection to conservation. Such programs build awareness and provide direct involvement, which has been shown to strengthen visitors' commitment to sustainable actions (Buckley, 2022). Additionally, visible conservation achievements—such as before-and-after habitat restoration images or success stories shared through follow-up digital engagement—can motivate tourists to adopt and maintain conservation-friendly practices.

Thus, while visitor awareness has a strong and positive influence on conservation behaviors, integrating motivational elements—such as personal involvement, social incentives, and ongoing digital engagement—could enhance the efficacy of awareness in promoting lasting conservation outcomes. This approach aligns with recent literature advocating for multifaceted strategies that combine educational content with engagement incentives, thus maximizing the impact of Ecotourism on environmental conservation (Ma et al., 2023; Wong et al., 2023). Ecotourism can better fulfill its dual role of educating visitors and actively contributing to environmental preservation through this combination.

#### 4.2.4. Visitor Awareness Mediates the Relations Between Ecotourism Activities and Environmental Conservation

The analysis confirmed that visitor awareness plays a significant mediating role in the relationship between ecotourism activities and environmental conservation, with a path coefficient that was both positive and statistically significant (T = 8.280, p = 0.000) (as indicated in Table IV). This finding supports Hypothesis 4, indicating that while Ecotourism directly promotes conservation, its impact is further amplified through heightened visitor awareness. This mediating effect aligns with studies by Ma et al. (2023) and Wong et al. (2023), who assert that awareness is a critical link enabling ecotourism activities to translate into substantial conservation outcomes. Awareness fosters a more profound understanding among tourists of the importance of conservation, encouraging sustainable behaviors beyond the immediate ecotourism experience.

The T-value of 8.280 underscores the strength of awareness as a bridge between ecotourism activities and

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

conservation actions, demonstrating the effectiveness of educational components in Ecotourism in fostering a conservation ethic among visitors. As Ballantyne and Packer (2016) suggest, awareness cultivated through hands-on, informative experiences within Ecotourism has the potential to instill a lasting conservation mindset. This enduring impact highlights the value of interactive and knowledge-based components in Ecotourism, such as conservation talks, guided tours, and workshops, which actively engage visitors in environmental education and allow them to connect with conservation issues personally.

However, the literature also suggests limitations to awareness alone as a mediator. Xu and He (2020), for example, found that awareness without structured opportunities for action might not consistently lead to conservation behavior, indicating that Ecotourism's effectiveness may depend on program design that goes beyond merely raising awareness. Additional interventions—such as calls to action, participatory conservation activities, or ongoing digital engagement—can reinforce the conservation message and provide visitors with actionable steps to support environmental protection. This finding suggests that while awareness is essential, the impact of Ecotourism can be significantly strengthened when awareness is paired with concrete engagement opportunities, thereby reinforcing the conservation ethic instilled during the ecotourism experience (García-Rosell et al., 2023).

Moreover, research by Buckley (2022) highlights that ecotourism programs combining education with tangible conservation tasks, such as reforestation efforts or wildlife monitoring, tend to produce more committed conservation advocates. These initiatives educate tourists and provide a sense of personal contribution, reinforcing their commitment to environmental protection. By allowing tourists to participate directly in conservation, Ecotourism can transform awareness into proactive conservation behaviors, addressing potential gaps where awareness may fall short.

This study underscores that visitor awareness is an influential mediating factor between ecotourism activities and environmental conservation. However, optimizing this relationship requires ecotourism programs to go beyond awareness-raising, integrating structured conservation activities and engagement prompts that empower tourists to contribute actively to conservation goals. This holistic approach aligns with recent literature advocating for multifaceted ecotourism strategies that foster awareness and provide opportunities for tangible conservation actions, thus maximizing the long-term ecological benefits of Ecotourism (Kim et al., 2022; Gossling & Buckley, 2021). Through such an approach, Ecotourism can serve as a sustained catalyst for environmental stewardship, equipping tourists with knowledge and actionable steps to support conservation in the future.

## 5. Conclusions and Implications

This study underscores the critical role of ecotourism activities in advancing environmental conservation, mainly by raising visitor awareness. Findings indicate that Ecotourism contributes directly to conservation and indirectly by nurturing a conservation mindset among tourists. This dual role as both an educational platform and a conservation tool reinforces Ecotourism's potential to instill sustainable behaviors in tourists, encouraging practices beyond their immediate experience. By engaging visitors through structured, interactive ecotourism activities, operators can cultivate an informed and responsible tourist population that actively supports preserving natural resources.

The empirical results highlight that well-designed ecotourism programs integrate educational elements and are highly effective in fostering conservation through heightened awareness. Visitor awareness was found to mediate the relationship between ecotourism activities and conservation efforts, suggesting that the impact of Ecotourism on conservation is maximized when educational components promote understanding and commitment to environmental stewardship. However, the findings also indicate that awareness alone may not be enough to drive conservation behaviors—active engagement opportunities are essential to translating awareness into actionable conservation support.

The implications of this study provide a foundation for ecotourism practitioners, community leaders, and policymakers. The following recommendations are proposed to strengthen the conservation impact of ecotourism initiatives:

a. Enhance Educational Programs: Developing interactive educational programs emphasizing local biodiversity and conservation practices is crucial for fostering ecological awareness among visitors. These programs should include experiential learning components—such as guided tours, workshops, and conservation talks—that offer visitors in-depth insights into the ecosystem. Research supports that education-focused Ecotourism can foster lasting conservation values by connecting tourists with environmental protection in a tangible, memorable way (Ballantyne & Packer, 2016). Further, digital tools like apps or interactive kiosks can enhance this experience by providing additional resources for learning and reflection after the visit.
b. Strengthen Community Engagement: Effective ecotourism initiatives involve local communities and align conservation efforts with community values and economic benefits. Involving community members in planning, operating, and guiding ecotourism activities ensures that programs reflect conservation priorities

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

while delivering economic returns to residents. Community-driven Ecotourism aligns visitor experiences with local perspectives, creating an authentic interaction that benefits both parties. Collaborating with community organizations can enhance conservation goals, providing a mutually beneficial framework where Ecotourism serves as a bridge between visitors and residents, supporting shared conservation objectives (Ma et al., 2023; Wong et al., 2023).

c. Promote Responsible Tourism Practices: Responsible tourism should be encouraged through clear signage, on-site engagement, and partnerships with environmental organizations promoting sustainable behaviors. Messaging around waste reduction, wildlife respect, and minimizing environmental impact can guide tourists in adopting eco-friendly practices during their visit. Ecotourism providers should consider incorporating "leave no trace" principles into their programs to underscore minimal-impact travel. Collaborating with conservation groups can extend this commitment, offering tourists avenues to contribute directly, such as through donations or volunteer programs that support conservation initiatives (Kim et al., 2022).
d. Support Policy Development for Sustainable Tourism: Policymakers are instrumental in shaping sustainable ecotourism practices by implementing regulations that prioritize environmental protection. Policies that manage visitor numbers establish protected areas, and set standards for eco-friendly practices can mitigate the potential environmental impact of increased tourism activity. Close collaboration between policymakers, ecotourism operators, conservation experts, and community representatives can create balanced policies that support the economic benefits of tourism while safeguarding environmental integrity. Integrating Ecotourism into broader conservation strategies ensures that tourism development aligns with long-term ecological Sustainability (Buckley, 2022).

## 6. Limitations and Future Research

This study underscores the role of Ecotourism in promoting environmental conservation through visitor awareness. However, several limitations suggest areas for future research to deepen understanding of Ecotourism's impact on conservation outcomes.

Sample Size and Sampling Technique: The study used a convenience sample of 133 visitors to Mangrove Hera Park, which, while suitable for preliminary exploration, limits generalizability. Future research could use random or stratified sampling across multiple ecotourism sites to enhance representativeness and applicability (Etikan et al., 2016).

Cross-Sectional Design: This study's cross-sectional design limits its ability to assess how visitor awareness and conservation behaviors evolve over time. Longitudinal studies could provide insight into the persistence of conservation attitudes, offering a clearer picture of Ecotourism's long-term impact on environmental behaviors (Saunders et al., 2019).

Self-Reported Data Constraints: Self-reported Likert-scale data, susceptible to social desirability bias, may not accurately reflect actual conservation behaviors. Future studies could incorporate objective measures, such as behavioral observations or follow-up assessments, to validate self-reported data and capture a fuller range of visitor behaviors (Podsakoff et al., 2003).

Context-Specific Focus: The study's focus on Mangrove Hera Park limits its applicability to ecotourism sites with different environmental and cultural dynamics. Comparative research across diverse ecotourism destinations would provide a broader understanding of how ecotourism practices support conservation across various ecosystems and cultural settings (Buckley, 2022).

Future Research Directions can also cover the following issues:

a. Longitudinal Studies on Conservation Awareness and Behavior: Tracking participants over time could reveal whether the awareness gained through Ecotourism translates into sustained pro-environmental behaviors, thus clarifying the long-term impact of Ecotourism.
b. Experimental Designs for Intervention Effectiveness: Future studies could employ experimental designs to evaluate the effectiveness of specific interventions, such as conservation workshops or digital engagement tools, in promoting awareness and conservation actions. This would help refine educational components within Ecotourism to maximize impact.
c. Comparative Studies Across Sites and Cultures: Research across multiple ecotourism destinations, particularly in varied ecological and cultural contexts, would provide insights into how local environmental factors shape Ecotourism's effectiveness. This approach could inform tailored ecotourism strategies for different cultural and ecological settings.

Vol.6, Issue 2, pp. 1-11, 2024
Available online at: https://tljbm.org/jurnal/index.php/tljbm

d. Advanced Behavioral Tracking: To overcome self-reported data limitations, future studies could use behavioral tracking methods like mobile apps and environmental pledges. This would enable a more precise assessment of visitors' conservation actions after their ecotourism experiences.
e. Post-Visit Digital Engagement and Follow-Up Programs: Given that awareness may wane over time, research could explore the role of post-visit digital tools, such as apps or social media engagement, in sustaining conservation behaviors. These tools could foster a long-term conservation mindset and build a dedicated community of conservation-minded tourists.

## References

Ali, F., Rasoolimanesh, S.M., & Cobanoglu, C., 2023. 'The role of ecotourism in sustainable development: Integrating economic, social, and environmental dimensions', Journal of Sustainable Tourism, 31(5), pp. 765-780.

Ballantyne, R. & Packer, J., 2016. 'Visitors' environmental awareness and conservation actions post-visit', Environmental Education Research, 22(3), pp. 436-456.

Boley, B.B., McGehee, N.G., & Hammett, A.L.T., 2021. 'Ecotourism, awareness, and environmental conservation: A comprehensive review', Tourism Management, 85, pp. 1-14.

Buckley, R., 2020. Nature-Based Tourism and Conservation. Wallingford: CABI.

Buckley, R., 2022. 'Sustainable tourism and biodiversity conservation', Annual Review of Environment and Resources, 47(1), pp. 439-462.

Creswell, J.W. & Creswell, J.D., 2018. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 5th ed. Thousand Oaks, CA: SAGE Publications.

Etikan, I., Musa, S.A. & Alkassim, R.S., 2016. 'Comparison of convenience sampling and purposive sampling', American Journal of Theoretical and Applied Statistics, 5(1), pp. 1-4.

Fornell, C. & Larcker, D.F., 1981. 'Evaluating structural equation models with unobservable variables and measurement error', Journal of Marketing Research, 18(1), pp. 39-50.

García-Rosell, J.-C., Törrönen, S., & Lainio, R., 2023. 'Ecotourism, awareness, and sustainable behaviors: A systematic review', Ecology and Society, 28(2), pp. 43-58.

Gifford, R. & Nilsson, A., 2014. 'Personal and social factors that influence pro-environmental concern and behavior: A review', International Journal of Psychology, 49(3), pp. 141-157.

Gossling, S. & Buckley, R., 2021. 'Ecotourism and biodiversity conservation', Current Issues in Tourism, 24(11), pp. 1440-1457.

Hair, J.F., Hult, G.T.M., Ringle, C.M. & Sarstedt, M., 2019. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). 2nd ed. Thousand Oaks, CA: SAGE Publications.

Henseler, J., Ringle, C.M., & Sarstedt, M., 2015. 'A new criterion for assessing discriminant validity in variance-based structural equation modeling', Journal of the Academy of Marketing Science, 43(1), pp. 115-135.

Joshi, A., Kale, S., Chandel, S., & Pal, D.K., 2015. 'Likert scale: Explored and explained', British Journal of Applied Science & Technology, 7(4), pp. 396-403.

Kim, M.J., Lee, C.K., & Bonn, M.A., 2022. 'Understanding visitor motivations in ecotourism: An analysis of pro-environmental behavior', Journal of Sustainable Tourism, 30(2), pp. 331-346.

Lai, P.H. & Nepal, S.K., 2020. 'Local perspectives of ecotourism development: Insights from a developing country', Tourism Geographies, 22(1), pp. 156-177.

Lim, S. & McAleer, M., 2023. 'Ecotourism and economic sustainability: The role of conservation and community engagement', Tourism Economics, 29(3), pp. 341-358.

Liu, J. & Wang, X., 2023. 'Balancing tourism development with environmental conservation: The case for sustainable ecotourism', Environmental Conservation, 50(2), pp. 178-186.

Ma, S., Cheng, W., & Yu, J., 2023. 'Community engagement and ecotourism: A framework for sustainable practices', International Journal of Environmental Research, 27(1), pp. 129-140.

Moore, J.D., Rahman, M., & Jenkins, H., 2023. 'Tourist engagement in biodiversity protection: Ecotourism's role in conservation', Journal of Environmental Management, 311, pp. 1-11.

Pizam, A., 2021. Ecotourism: A Sustainable Development Approach. Cambridge: Cambridge University Press.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. & Podsakoff, N.P., 2003. 'Common method biases in behavioral research: A critical review of the literature and recommended remedies', Journal of Applied Psychology, 88(5), pp. 879-903.

Razzaq, A., Ramkissoon, H., & Mavondo, F.T., 2022. 'Ecotourism and community development: Exploring community involvement in tourism planning', Sustainability, 14(6), pp. 1-16.

Ringle, C.M., Wende, S., & Becker, J.-M., 2015. SmartPLS 3. Boenningstedt: SmartPLS GmbH.

Saunders, M., Lewis, P. & Thornhill, A., 2019. Research Methods for Business Students. 8th ed. Harlow: Pearson Education.

Su, L., & Swanson, S.R., 2022. 'Tourism as a tool for biodiversity conservation: Assessing the role of ecotourism', Journal of Ecotourism, 21(3), pp. 243-261.

Su, L., Zhou, X., & Fan, X., 2022. 'Understanding tourists' pro-environmental intentions: The influence of environmental awareness and responsibility', Sustainable Tourism Journal, 28(5), pp. 683-697.

The International Ecotourism Society (TIES), 2015. What is ecotourism? [Online] Available at: https://www.ecotourism.org/what-is-ecotourism [Accessed 1 November 2024].

Wang, S., He, Y., & Ma, J., 2023. 'Ecotourism's environmental and social impact: Examining visitor awareness in conservation areas', Journal of Environmental Tourism, 42(6), pp. 1234-1248.

Wong, R., Liu, H., & Packer, J., 2023. 'Ecotourism, environmental awareness, and sustainability: A review', Tourism Management, 100, pp. 1-12.

Wu, M.Y., Zhang, Z. & Zhang, J., 2021. 'Sustainable tourism and pro-environmental behavior: A long-term perspective on ecotourism's impact', Tourism Geographies, 23(2), pp. 209-222.

Xu, J. & He, Q., 2020. 'Ecotourism education and conservation intentions: How sustainable education enhances pro-environmental behavior', Journal of Environmental Education, 51(1), pp. 1-16.

Xue, Y., Yang, J., & Wang, R., 2020. 'Regulating ecotourism: Challenges and strategies for conservation and sustainable development', Ecological Indicators, 118, pp. 1-10.

Zhang, W. & Zhang, H., 2019. 'Awareness and pro-environmental behavior: A study on the motivational factors in ecotourism', Environmental Psychology Journal, 44(1), pp. 13-25.