Jurnal Wacana Ekonomi
Fakultas Ekonomi, Universitas Garut
P-ISSN: 1412-5897; E-ISSN: 2715-517X

Promoting Environmentally Responsible Behaviour Among Tourists Through Experiencescapes and Place Attachment by Strengthening Environmental Concern in Nature Tourism in West Nusa Tenggara

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Abstract

The growth of nature-based tourism in Indonesia has not been accompanied by a corresponding improvement in visitor environmental behaviour, creating a persistent gap between tourism expansion and ecological sustainability. This study examines the relationships among Experiencescape, Place Attachment, Environmental Concern, and Environmentally Responsible Behaviour (ERB) among tourists visiting nature-based destinations in Nusa Tenggara Barat (NTB), Indonesia. Using a quantitative verificative design, data were collected from 266 respondents through purposive sampling and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with 5,000 bootstrapping resamples. The results confirm that Experiencescape significantly influences Place Attachment, and that Place Attachment positively drives ERB. However, Experiencescape did not directly influence ERB, indicating that behavioural change operates through emotional mediation rather than direct experiential stimuli. Environmental Concern significantly moderated the Experiencescape–Place Attachment relationship in a negative direction, suggesting that environmentally conscious visitors apply more critical evaluative standards to the experiential environment. Environmental Concern did not significantly moderate either the Experiencescape–ERB or Place Attachment–ERB relationships. These findings highlight that fostering deep emotional bonds between tourists and natural destinations is more effective than relying on experiential quality alone to promote responsible environmental behaviour. Destination managers and policymakers in NTB are encouraged to prioritise ecologically authentic and interpretive experiencescape designs that strengthen place attachment as an indirect pathway to sustainable visitor conduct.

Keywords: Environmentally Responsible Behaviour, Experiencescape, Place Attachment, Environmental Concern, Nature-Based Tourism

1 Introduction

The global tourism sector has emerged as one of the most dynamic and fastest-growing industries in the world economy, contributing approximately 10% to global GDP and generating hundreds of millions of employment opportunities across both developed and developing nations (Matyashova *et al.*, 2021). Among its various segments, nature-based tourism has experienced particularly remarkable growth, driven by a structural shift in traveller preferences toward authentic, immersive, and environmentally grounded experiences (Naparin *et al.*, 2025). Tourists increasingly seek destinations that offer direct contact with natural ecosystems ranging from tropical coastlines and coral reefs to mountain trails and biodiversity-rich forests as a counterweight to the pressures of urban life. This trend has positioned nature-based tourism as a strategic pillar of economic development, especially in developing countries endowed with rich natural capital.

However, the rapid expansion of tourism into natural environments has generated serious and well-documented ecological consequences. Increased tourist visitation correlates with mounting volumes of solid waste and pollution in sensitive ecosystems (Obersteiner *et al.*, 2021), progressive degradation of coastal and marine habitats (Hernández *et al.*, 2023), physical damage to coral reef systems from recreational activities such as diving and snorkelling (Shokri y Mohammadi, 2021), accelerated erosion of hiking and trekking trails (Jula y Voiculescu, 2022), and intensified pressure on biodiversity through habitat disturbance and wildlife displacement (Jula y Voiculescu, 2022). International reports and empirical studies consistently identify irresponsible visitor behaviour as one of the central causal factors behind these forms of environmental degradation, underscoring that the problem is not merely one of volume but of the quality and awareness embedded in tourist conduct.

In the context of Indonesia, the recovery and growth of the tourism sector following the COVID-19 pandemic has been particularly pronounced. Data from the Ministry of Tourism and Creative Economy indicate that the number of international tourist arrivals in 2023 reached 11.68 million, representing an increase of nearly twofold compared to the previous year (Rahayu, 2025). Empirical evidence from across Indonesia confirms that tourism activity is already producing measurable adverse effects on natural environments. Research conducted in the coastal zone of Pantai Cemara in Banyuwangi found that tourism-related activities are positively correlated with elevated concentrations of ammonia and organic matter in surrounding water bodies, indicating a direct link between visitor behaviour and aquatic pollution (Aditya Saputra *et al.*, 2026). A separate study on the Bantimurung Bulusaraung National Park demonstrated that unregulated visitor activity contributes to significant disturbances in vegetation cover and wildlife habitat, compromising the ecological integrity of a legally protected area (Sintia, 2023). Additionally, academic reports from Universitas Andalas have highlighted the growing problem of solid waste accumulation at numerous tourism sites, attributed in large part to low levels of environmental care and hygiene awareness among visitors (Olivia, 2024). Together, these findings paint a consistent picture: the expansion of nature tourism in Indonesia has not been accompanied by a corresponding improvement in visitor environmental behaviour.

These facts expose a fundamental and persistent gap: the growth of nature-based tourism does not automatically generate Environmentally Responsible Behaviour (ERB) among tourists. ERB is broadly defined as the conscious and deliberate effort of individuals to minimise their negative impact on the natural environment, encompassing actions such as refraining from littering, adhering to conservation regulations, protecting natural facilities and wildlife, reducing resource consumption, and actively supporting the principles of sustainable tourism (Hasan, 2024). The theoretical literature offers several frameworks for understanding the formation of environmentally responsible behaviour. The experiencescape perspective, Place Attachment theory offers a relational account of how tourists' emotional and cognitive bonds with specific places can motivate protective behaviour. Scholars argue that when individuals develop a sense of place identity and place dependence components of attachment, they are more inclined to act in ways that preserve the integrity of that environment (Arissaputra *et al.*, 2024). In this regard, a meaningful and emotionally resonant experiencescape is

conceptually capable of deepening place attachment, which in turn may strengthen ERB. This mediated pathway represents an important theoretical mechanism linking the quality of tourism experience to tangible pro-environmental outcomes.

However, prior empirical research has produced inconsistent findings regarding these relationships. One construct that has been theorised to serve this moderating function is Environmental Concern defined as the degree to which an individual is aware of, and emotionally engaged with, environmental problems and sustainability issues. Research indicates that individuals with high levels of environmental concern are substantially more responsive to sustainability-embedded experiencescapes and are more likely to translate place-based emotional bonds into concrete pro-environmental actions (Li *et al.*, 2024). Environmental concern thus operates as a psychological amplifier that conditions the strength and direction of the relationships between experiencescape, place attachment, and ERB.

Despite the conceptual coherence of these constructs, research that integrates Experiencescape, Place Attachment, and Environmental Concern into a single comprehensive model within a nature-based tourism context remains limited. This gap is particularly pronounced in the context of Nusa Tenggara Barat (NTB), a province characterised by a diverse array of coastal and mountainous natural tourism destinations, including internationally recognised sites that are under increasing visitor pressure. This study addresses that theoretical and empirical gap by developing and testing an integrated model that examines the direct effects of Experiencescape on Place Attachment and ERB, the mediating role of Place Attachment, and the moderating function of Environmental Concern with the aim of generating an evidence-based framework that can meaningfully inform sustainable tourism policy and destination management practice in NTB and beyond.

More specifically, three interrelated gaps remain underexplored. First, although a substantial body of work links experiencescape to satisfaction and behavioural intentions, comparatively little research has empirically tested whether place attachment operates as the affective mechanism through which experiencescape is translated into environmentally responsible behaviour; the mediating pathway is therefore frequently assumed rather than formally verified. Second, prior evidence on the role of environmental concern is inconsistent: while several studies position it as a psychological amplifier that strengthens pro-environmental responses (Aman et al., 2021; Li et al., 2024), others report weak or non-significant moderating effects, implying that its boundary conditions are still poorly understood. Third, these constructs have rarely been integrated within a single moderated-mediation model, and almost never in the under-researched setting of nature-based tourism in eastern Indonesia. Theoretically, the moderating logic of environmental concern can be grounded in established socio-psychological frameworks such as the Value–Belief–Norm perspective and attitude–behaviour consistency theory, which hold that environmentally salient dispositions condition the degree to which situational experiences are converted into place bonds and conservation behaviour. By explicitly modelling Environmental Concern as a moderator of both the experiencescape–attachment and attachment–behaviour links, this study clarifies these boundary conditions and responds directly to the contradictory findings reported in the literature.

2 Literature Review

2.1 Environmentally Responsible Behaviour

Environmentally Responsible Behaviour (ERB) in the tourism context refers to tourist actions that are consciously aimed at minimizing negative environmental impacts and supporting the sustainability of destinations (Arissaputra, 2025). ERB includes behaviours such as disposing of waste properly, reducing plastic use, not damaging natural facilities, complying with conservation regulations, and supporting environmentally friendly products or services. Recent studies indicate that ERB is influenced by a combination of cognitive, affective, and situational factors (Sthapit *et al.*, 2022b;

Patwary, 2023; Arissaputra *et al.*, 2024). However, there are still inconsistent findings regarding the main determinants of ERB, particularly in the context of nature-based tourism in developing countries.

2.2 Environmental Concern

Environmental Concern refers to the level of an individual's concern about environmental issues and their perception of the importance of environmental protection (Li *et al.*, 2024). Individuals with a high level of environmental concern tend to show positive attitudes toward sustainable practices and are more responsive to conservation messages. In the tourism context, research shows that environmental concern acts as both a predictor and a moderating variable in the relationship between tourism experiences and environmentally friendly behaviour (Aman *et al.*, 2021; Aytekin *et al.*, 2023; Elshaer *et al.*, 2024; Khan, 2024). Thus, environmental concern has the potential to strengthen the influence of experiencescape and place attachment on ERB.

From a theoretical standpoint, the moderating function of environmental concern is consistent with the Value–Belief–Norm theory and the attitude–behaviour consistency perspective, which contend that an individual's underlying environmental values shape the way situational stimuli are appraised and acted upon (Aytekin et al., 2023; Khan, 2024). Within this logic, environmental concern is expected to operate as a boundary condition rather than a direct driver: for visitors with strong environmental concern, an ecologically authentic experiencescape should more readily foster place attachment and convert emotional bonds into responsible behaviour, whereas the same experiences may be appraised more critically when concern is high but the destination falls short of ecological expectations. This theoretical reasoning underpins the moderating hypotheses (H4–H6) tested in this study and motivates the explicit positioning of environmental concern as a moderator within the integrated model.

2.3 Place Attachment

Place Attachment refers to the emotional and functional bond between individuals and a place (Giuliani, 2003). This concept generally consists of two main dimensions, namely place identity (identity-based attachment) and place dependence (functional dependence on a place). In the context of nature-based tourism, place attachment develops through meaningful experiences and repeated interactions with destinations. Research over the past decade shows that place attachment significantly contributes to environmental conservation behaviour and support for conservation policies (Meng y Si, 2022; Xie y Wang, 2024; Mandić *et al.*, 2025). However, emotional attachment does not always automatically lead to actual behaviour without an adequate level of environmental concern.

2.4 Experiencescape

Experiencescape is an extension of the servicescape concept that emphasizes the holistic tourist experience through physical, social, symbolic, and atmospheric elements of a destination (Lin *et al.*, 2022). Experiencescape includes spatial design, social interactions, environmental interpretation, and aesthetic elements that shape tourists' perceptions and emotions. Recent studies indicate that experiencescape can enhance emotional engagement, satisfaction, and intentions toward sustainable behaviour (Piramanayagam et al., 2021; Zhou, 2024). However, the direct relationship between experiencescape and ERB still requires further investigation, particularly by considering psychological variables such as place attachment and environmental concern.

2.5 Hypothesis

Based on the literature review, it can be formulated that Experiencescape influences Place Attachment and has both direct and indirect effects on ERB. Environmental Concern acts as a moderating variable that strengthens the relationship between Experiencescape and Place Attachment, as well as ERB, and also between Place Attachment and ERB. In addition, Place Attachment is theorised to function as a

mediating mechanism that transmits the effect of Experiencescape to ERB, reflecting the emotion-driven pathway through which experiential quality is translated into responsible behaviour. The hypotheses developed in this study are as follows:
H1: Experiencescape influences Place Attachment
H2: Experiencescape influences Environmentally Responsible Behaviour
H3: Place Attachment influences Environmentally Responsible Behaviour
H4: Environmental Concern moderates the influence of Experiencescape on Place Attachment
H5: Environmental Concern moderates the influence of Experiencescape on Environmentally Responsible Behaviour
H6: Environmental Concern moderates the influence of Place Attachment on Environmentally Responsible Behaviour
H7: Place Attachment mediates the influence of Experiencescape on Environmentally Responsible Behaviour

3 Research Method

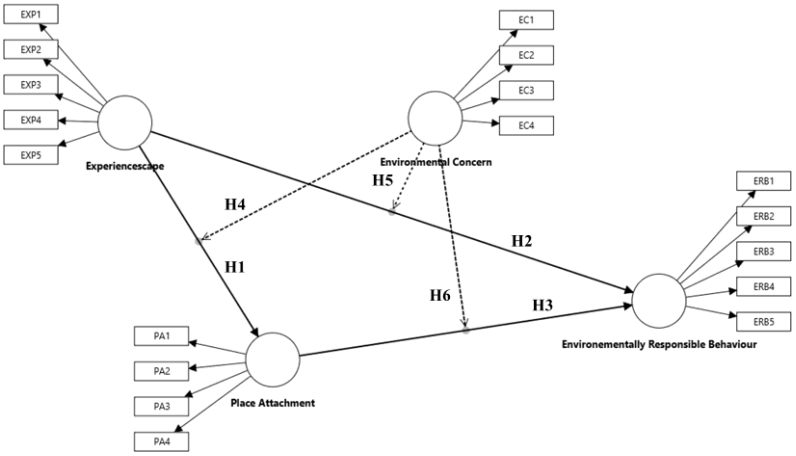

Figure 1: Research Model
Source: Authors own work

This study uses a quantitative approach with a verificative design. The quantitative approach is chosen because this study aims to test a conceptual model formulated based on theory and previous research through the measurement of latent variables using structured instruments (Ghanad, 2023). A verificative design is used to confirm the structural relationships between variables and to identify both direct and indirect effects within the research model. This study is conducted at nature-based tourism destinations in West Nusa Tenggara Province (NTB). The selection of this location is based on NTB's characteristics as one of Indonesia's leading nature-based tourism destinations, offering major attractions such as coastal ecosystems, marine areas, and mountainous landscapes. These destinations include Sembalun–Sambelia, Gili Trawangan, Senaru, Gili Air, and Mount Rinjani, all of which are located within NTB Province. This diversity of destinations makes NTB highly relevant for examining tourist behaviour in the context of environmental sustainability.

The population of this study consists of all tourists visiting nature-based tourism destinations in West Nusa Tenggara Province. Considering that the population cannot be precisely identified and is dynamic in nature, the sampling technique used is purposive sampling. Purposive sampling is selected because the required respondents are tourists who have direct experience with nature-based tourism destinations in NTB (Tajik *et al.*, 2025). The respondent criteria were as follows: (1) being at least 17 years of age, and (2) currently visiting or having visited a nature-based tourism destination in NTB within the past one year (2025–2026). The determination of the sample size refers to guidelines in PLS-SEM, which suggest a minimum sample size of ten times the number of indicators or ten times the largest number

of structural paths directed at a particular construct in the model (Hair Jr *et al.*, 2021). In this study, there are 18 indicators, so the minimum required sample size is: 10 × 18 = 180 respondents. To increase statistical power and the stability of parameter estimation, this study targets a sample size of 200–220 respondents (Hair *et al.*, 2019).

The analytical technique used is Structural Equation Modeling based on Partial Least Squares (SEM-PLS). The selection of SEM-PLS is based on several methodological considerations. First, the research model is predictive in nature and aims to develop a behavioural model in the context of nature-based tourism. Second, SEM-PLS is more flexible regarding data Hair Jr et al. (2021), PLS-SEM is particularly appropriate for research oriented toward theory development and prediction-oriented research. In addition, this method allows the testing of moderating relationships more flexibly through the product indicator approach or the two-stage approach.

Table 1: Research's Instruments

No	Variables	Indicators	Sources
1	**Experiencescape (EXP)**	1. **(EXP1)** The atmosphere of nature-based tourism is very appealing to my senses. 2. **(EXP2)** The level of crowding at the nature-based tourism destination does not disturb me. 3. **(EXP3)** The employees at the nature-based tourism destination are friendly to me. 4. **(EXP4)** Tourists at the nature-based tourism destination are easy to socialize with. 5. **(EXP5)** The nature-based tourism I visit reflects natural beauty.	(Pizam y Tasci, 2019; Sthapit *et al.*, 2022a)
2	**Place Attachment (PA)**	1. **(PA1)** I feel that the nature-based tourism destination is part of myself. 2. **(PA2)** The nature-based tourism destination is the best place to do what I enjoy. 3. **(PA3)** The nature-based tourism destination is very special to me. 4. **(PA4)** No. other tourism destination can be compared to the nature-based tourism destination I visit.	(Williams y Vaske, 2003; Raymond *et al.*, 2010; Arissaputra *et al.*, 2024)
3	**Environmental Concern (EC)**	1. **(EC1)** I am very concerned about the worsening condition of the world's environment. 2. **(EC2)** I believe that damaging nature often leads to serious consequences. 3. **(EC3)** I feel that the balance of nature is very fragile and easily disturbed. 4. **(EC4)** I feel that I must live in harmony with nature in order to survive.	(Aman *et al.*, 2021; Arissaputra *et al.*, 2024; Li *et al.*, 2024)
4	**Environmentally Responsible Behaviour (ERB)**	1. **(ERB1)** I comply with regulations not to damage the natural environment at the nature-based tourism destination I visit.	(Su *et al.*, 2018; Sthapit *et al.*, 2022a)

	2. **(ERB2)** I try not to disturb fauna and flora during nature-based tourism trips. 3. **(ERB3)** When I generate waste during nature-based tourism trips, I dispose of it in the trash bin. 4. **(ERB4)** If there are environmental restoration activities at the nature-based tourism destination I visit, I am willing to participate. 5. **(ERB5)** I try to persuade others to protect the natural environment at nature-based tourism destinations.

Source: Authors own work

Based on figure 1, the study uses a closed-ended questionnaire with a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to measure respondents' perceptions, attitudes, and behavioural tendencies. The instrument is developed through literature review, contextual adaptation to NTB tourism, expert judgment for content validity, and a pilot test with around 30 respondents. Validity and reliability are assessed using PLS-SEM outer model evaluation. Convergent validity is measured by outer loading (≥ 0.70) and AVE (≥ 0.50), while reliability is assessed using Composite Reliability and Cronbach's Alpha (≥ 0.70). Discriminant validity is tested using Fornell-Larcker and HTMT (≤ 0.90).

Data analysis is conducted using SEM-PLS with SmartPLS 4 software. The analysis involves two main stages: evaluation of the measurement model (outer model) and the structural model (inner model). The outer model is assessed to ensure that indicators are valid and reliable in measuring latent constructs, using outer loading, AVE, Composite Reliability, Cronbach's Alpha, and HTMT criteria (Hair et al., 2019). The inner model evaluates the relationships between variables using R^2, f^2, Q^2, and path coefficients. Significance testing is carried out using bootstrapping with at least 5,000 resamples (Hair et al., 2021), where relationships are considered significant if t-value > 1.96 and p-value < 0.05. Moderation effects are tested using interaction constructs through the product indicator or two-stage approach in PLS-SEM. In addition, the overall model fit is examined through the standardised root mean square residual (SRMR), with values below 0.08 indicating an acceptable fit (Hair et al., 2019), and the potential for common method bias is evaluated through the inner-model variance inflation factors (VIF), where values below the recommended threshold indicate that bias is not a serious concern (Hair et al., 2019). The mediating role of Place Attachment is tested by examining the bootstrapped specific indirect effects together with their bias-corrected 95% confidence intervals.

4 Research Results And Discussions

4.1 Respondent's Profile

Table 2: Demographic Profile of Respondents

Demographic Characteristics	Frequency (n)	Percentage (%)
Gender		
Male	120	45.1%
Female	146	54.9%
Total	**266**	**100%**
Age		
17 - 25 years	107	40.2%
26 - 34 years	93	34.9%
35 - 42 years	40	15.0%

> 42 years	26	9.8%
Total	**266**	**100%**
Occupation		
Civil Servant (PNS)	27	10.2%
Private Employee (Swasta)	67	25.2%
Entrepreneur (Wirausaha)	40	15.0%
Student	106	39.8%
Others	26	9.8%
Total	**266**	**100%**
Monthly Income		
< IDR 2,000,000	93	34.9%
IDR 2,000,000 - 4,000,000	80	30.1%
IDR 4,000,000 - 6,000,000	53	19.9%
> IDR 6,000,000	40	15.0%
Total	**266**	**100%**
Domicile		
NTB (Local)	147	55.3%
Outside NTB	119	44.7%
Total	**266**	**100%**

Source: Authors own work

A total of 266 tourists visiting nature-based destinations in Nusa Tenggara Barat (NTB) participated in this study. The respondent profile reveals a visitor population that is predominantly young, with three out of four respondents aged between 17 and 34 years, suggesting that NTB's natural tourism destinations strongly attract the millennial and Gen-Z demographic. Female visitors slightly outnumbered their male counterparts, comprising just over half of the total sample, a pattern commonly observed in leisure and nature-based tourism contexts. In terms of occupation, students represented the single largest group, accounting for nearly four in ten respondents. This is closely followed by private sector employees and entrepreneurs, while civil servants and other occupational groups made up a smaller portion of the sample. The dominance of students is reflected in the income distribution, where the majority of respondents reported monthly earnings below IDR 4,000,000 indicating that most visitors to NTB's nature destinations are budget-conscious travellers whose financial capacity may shape the frequency and depth of their tourism engagement. Geographically, slightly more than half of respondents were local visitors originating from within NTB, while the remaining visitors came from outside the province. This balance between local and non-local visitors highlights the dual appeal of NTB's nature destinations as both a recreational space for residents and an attractive destination for tourists from other regions of Indonesia. The relatively high share of local visitors is a noteworthy characteristic of the sample, as familiarity with the local environment may shape how visitors emotionally connect with and behave within these natural spaces..

4.2 Respondent's Experience

Table 3: Experience Profile of Respondents

Experience Characteristics	Frequency (n)	Percentage (%)
Frequency of Visits to the Destination		
First-time visit	147	55.3%
2 - 3 visits	93	34.9%
More than 3 visits	26	9.8%
Total	**266**	**100%**

Primary Motivation for Visiting		
Recreation / Leisure	160	60.2%
Photography / Content Creation	53	19.9%
Education / Research	32	12.0%
Others	21	7.9%
Total	**266**	**100%**
Duration of Visit		
Same-day visit (Day trip)	133	50.0%
1 - 2 nights	93	34.9%
3 nights or more	40	15.0%
Total	**266**	**100%**
Source of Information about the Destination		
Social media	147	55.3%
Friends / Family Recommendation	67	25.2%
Travel Agent / Online Platform	32	12.0%
Others	20	7.5%
Total	**266**	**100%**
Prior Participation in Environmental Conservation Activities		
Never	133	50.0%
Rarely	80	30.1%
Sometimes	40	15.0%
Often	13	4.9%
Total	**266**	**100%**
Awareness of Environmental Issues at the Destination		
Not Aware	93	34.9%
Somewhat Aware	120	45.1%
Very Aware	53	19.9%
Total	**266**	**100%**

Source: Authors own work

The experience profile of respondents reveals a visitor population that is largely new to the destination, recreationally motivated, and environmentally disengaged. More than half were first-time visitors, and the vast majority cited recreation and leisure as their primary purpose for visiting, with photography and content creation emerging as the second most common motivation consistent with the young, social-media-oriented demographic identified earlier. Half of all respondents completed only a same-day visit, and social media was the dominant channel through which they discovered the destination. Most striking, however, are the findings related to environmental engagement. Eight out of ten respondents reported little to no prior participation in environmental conservation activities, and fewer than one in five considered themselves highly aware of environmental issues at the destination they visited. These characteristics collectively portray a visitor base that, while drawn to natural settings, has not yet developed a strong or active environmental consciousness a contextual reality that is important for interpreting the structural relationships examined in this study.

4.3 Outer Model

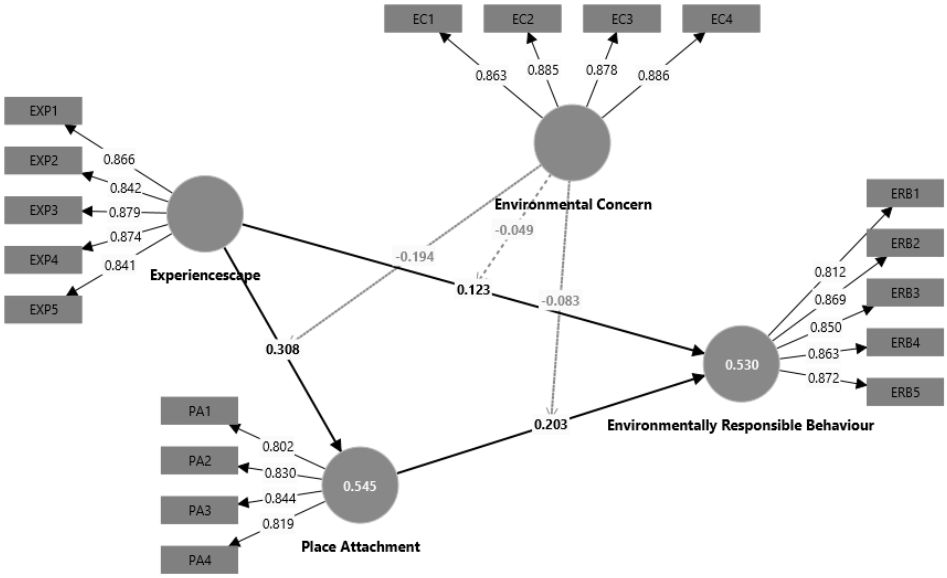

Figure 2: Outer Model
Source: Authors own work

The outer model presented in Figure 2 illustrates the measurement structure of four latent constructs examined in this study. Experiencescape was measured using five indicators (EXP1–EXP5), with factor loadings ranging from 0.841 to 0.879. Place Attachment was reflected by four indicators (PA1–PA4), with loadings between 0.802 and 0.844, and an R^2 value of 0.545, indicating that 54.5% of its variance is explained by Experiencescape. Environmental Concern was measured through four indicators (EC1–EC4), yielding loadings between 0.863 and 0.886. Environmentally Responsible Behaviour (ERB) was captured by five indicators (ERB1–ERB5), with loadings ranging from 0.812 to 0.872, and an R^2 value of 0.530, suggesting that 53.0% of the variance in ERB is explained by the combined influence of Experiencescape, Place Attachment, and the moderating role of Environmental Concern. All indicator loadings exceeded the recommended threshold of 0.70 (Hair *et al.*, 2019), confirming satisfactory indicator reliability across all constructs.

Table 4: Construct Reliability and Validity

Construct	Items	Loading Range (≥0.70)	Composite Reliability (≥0.70)	Average Variance Extracted (≥0.50)
Experiencescape (EXP)	5	0.841–0.879	0.913	0.740
Place Attachment (PA)	4	0.802–0.844	0.842	0.679
Environmental Concern (EC)	4	0.863–0.886	0.901	0.771
Environmentally Responsible Behaviour (ERB)	5	0.812–0.872	0.907	0.728

Source: Authors own work

As presented in Table 4, all constructs demonstrated satisfactory reliability and convergent validity. Composite Reliability (CR) values ranged from 0.842 to 0.913, all exceeding the minimum threshold of 0.70 (Hair *et al.*, 2019), confirming the internal consistency of each construct. Average Variance Extracted (AVE) values ranged from 0.679 to 0.771, all surpassing the 0.50 benchmark (Hair *et al.*, 2019), indicating that each construct explains the majority of variance in its respective indicators. These

results collectively confirm that the measurement model meets the required standards for reliability and convergent validity.

Table 5: Heterotrait-Monotrait Ratio (HTMT)

Construct	EXP	PA	EC	ERB
		(< 0.85)		
EXP	-	0.718	0.729	0.644
PA	0.718	-	0.746	0.692
EC	0.729	0.746	-	0.735
ERB	0.644	0.692	0.735	-

Source: Authors own work

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT), as presented in Table 5. All HTMT values between constructs ranged from 0.644 to 0.746, remaining well below the conservative threshold of 0.85 (Hair *et al.*, 2019), confirming that each construct is empirically distinct from the others. These results establish adequate discriminant validity across all constructs in the measurement model.

4.4 Inner Model

Table 6: Coefficient of Determination (R^2)

Construct	R^2	R^2 adjusted
Place Attachment (PA)	0.545	0.540
Environmentally Responsible Behaviour (ERB)	0.530	0.521

Source: Authors own work

The R^2 value for Environmentally Responsible Behaviour was 0.530, indicating that 53.0% of the variance in ERB is explained by the combined influence of Experiencescape, Place Attachment, and Environmental Concern within the model. According to Hair *et al.* (2019), this value reflects a moderate to substantial level of explanatory power, suggesting that the structural model possesses adequate predictive accuracy. In addition, Place Attachment yielded an R^2 of 0.545 (R^2 adjusted = 0.540), indicating that 54.5% of its variance is jointly explained by Experiencescape, Environmental Concern, and the interaction term, while the R^2 adjusted value for ERB was 0.521. Both endogenous constructs therefore exhibit moderate to substantial explanatory power.

Beyond explanatory power, the effect size (f^2) was examined to assess the practical contribution of each predictor to its target construct. Following Hair et al. (2019), f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. As reported in Table 7, Experiencescape exerts a small-to-medium effect on Place Attachment ($f^2 = 0.114$), and Environmental Concern contributes meaningful effects on both Place Attachment ($f^2 = 0.093$) and ERB ($f^2 = 0.119$). The interaction term Environmental Concern × Experiencescape produces a substantive effect on Place Attachment ($f^2 = 0.108$), corroborating the significant moderation reported for H4. By contrast, the direct effect of Experiencescape on ERB ($f^2 = 0.012$) and the two non-significant interaction terms on ERB ($f^2 = 0.002$ and 0.005) are negligible, consistent with the rejection of H2, H5, and H6.

Table 7: Effect Size (f^2)

Path	f^2	Effect Size
Experiencescape → Place Attachment	0.114	Small–medium
Experiencescape → ERB	0.012	Negligible

Place Attachment → ERB	0.035	Small
Environmental Concern → Place Attachment	0.093	Small
Environmental Concern → ERB	0.119	Small–medium
EC × Experiencescape → Place Attachment	0.108	Small–medium
EC × Experiencescape → ERB	0.002	Negligible
EC × Place Attachment → ERB	0.005	Negligible

Source: Authors' own work

Predictive relevance was assessed using the PLSpredict procedure with ten-fold cross-validation. At the construct level, a Q^2predict value greater than zero indicates that the PLS-SEM model outperforms the naive mean-based benchmark and therefore possesses out-of-sample predictive relevance for the corresponding endogenous construct (Hair et al., 2019). The results are summarised in Table 8.

Table 8: Predictive Relevance (Q^2predict)

Construct	**Q^2predict**	**Decision**
Place Attachment	0.514	$Q^2 > 0$ = relevant
Environmentally Responsible Behaviour (ERB)	0.459	$Q^2 > 0$ = relevant

Source: Authors' own work

As shown in Table 8, both endogenous constructs returned Q^2predict values well above zero (Place Attachment = 0.514; ERB = 0.459), confirming that the model possesses predictive relevance. A complementary assessment of predictive power based on the indicator-level PLSpredict statistics indicated that, for the Place Attachment indicators, the PLS-SEM RMSE values were lower than those of the naive linear-model (LM) benchmark across all items, reflecting high predictive power, whereas for the ERB indicators the majority of items recorded lower PLS-SEM RMSE than the LM benchmark, reflecting medium predictive power.

The overall model fit was assessed using the standardised root mean square residual (SRMR) and related approximate fit indices. As shown in Table 9, the estimated model produced an SRMR of 0.046, comfortably below the conservative 0.08 threshold (Hair et al., 2019), indicating a good fit between the empirical and model-implied correlation matrices. The Normed Fit Index (NFI) of 0.924 further supports an acceptable model fit.

Table 9: Model Fit Indices

Index	**Saturated Model**	**Estimated Model**	**Threshold**
SRMR	0.046	0.046	< 0.08
d_ULS	0.369	0.363	—
d_G	0.198	0.175	—
NFI	0.909	0.924	≥ 0.90

Source: Authors' own work

Because the data were obtained from a single self-reported questionnaire, the potential for common method bias (CMB) was assessed using the inner-model variance inflation factors (VIF), in line with the collinearity assessment guidelines of Hair et al. (2019). As reported in Table 10, all VIF values for the substantive (non-interaction) structural paths range from 1.819 to 2.791 and remain below the conservative threshold of 3.3, indicating that common method bias is not a serious concern in this study. The comparatively higher VIF values for the two product-interaction terms (5.430 and 5.287) are an

expected artefact of the product-indicator approach used to model moderation and do not reflect pathological collinearity among the substantive constructs.

Table 10: Collinearity (Inner VIF) and Common Method Bias Assessment

Path (Predictor → Outcome)	**VIF**
Environmental Concern → ERB	2.287
Environmental Concern → Place Attachment	2.080
Experiencescape → ERB	2.791
Experiencescape → Place Attachment	1.819
Place Attachment → ERB	2.497
EC × Experiencescape → ERB	5.430
EC × Experiencescape → Place Attachment	1.499
EC × Place Attachment → ERB	5.287

Source: Authors' own work

Table 11: Hypothesis Testing

Hypothesis	**Path**	**β**	**T-Statistics (≥ 1.96)**	**P-Values (< 0.05)**	**Decision**
H1	EXP → PA	0.308	4.815	0.000	Supported
H2	EXP → ERB	0.123	1.392	0.164	Not Supported
H3	PA → ERB	0.203	2.288	0.022	Supported
H4	EC × EXP → PA	-0.194	5.249	0.000	Supported
H5	EC × EXP → ERB	-0.049	0.499	0.618	Not Supported
H6	EC × PA → ERB	-0.083	0.878	0.380	Not Supported

Source: Authors own work

Hypothesis testing was conducted using bootstrapping, with a path coefficient considered statistically significant when the T-statistic exceeded 1.96 and the p-value fell below 0.05 (Hair *et al.*, 2019).The results of hypothesis testing are presented in Table 11. Out of six hypotheses proposed, three were supported and three were rejected. H1 was supported, confirming that Experiencescape significantly influences Place Attachment. H3 was similarly supported, demonstrating that Place Attachment positively influences Environmentally Responsible Behaviour. H4 was also supported, revealing that Environmental Concern significantly moderates the relationship between Experiencescape and Place Attachment, albeit in a negative direction. In contrast, H2 was not supported, indicating that Experiencescape does not directly influence ERB. H5 and H6 were likewise rejected, suggesting that Environmental Concern does not significantly moderate either the Experiencescape–ERB or the Place Attachment–ERB relationship.

4.5 Mediation Analysis

To address the mediating role of Place Attachment implied by the conceptual model, the indirect effects were examined through bootstrapping with 5,000 resamples, using bias-corrected and accelerated (BCa) 95% confidence intervals. An indirect effect is considered significant when the confidence interval does not include zero and the corresponding p-value is below 0.05 (Hair et al., 2021). The results of the specific indirect effects are presented in Table 12.

Table 12: Specific Indirect Effects (Mediation Analysis)

Indirect Path	β	T-Stat.	P-Value	95% CI (BCa)	Decision
Experiencescape → Place Attachment → ERB	0.063	1.967	0.049	[0.011, 0.137]	Supported (full mediation)
Environmental Concern → Place Attachment → ERB	0.060	1.835	0.067	[0.009, 0.137]	Not supported
EC × Experiencescape → Place Attachment → ERB	-0.039	2.071	0.038	[-0.084, -0.008]	Supported (moderated mediation)

Source: Authors' own work

The mediation analysis confirms that Place Attachment mediates the relationship between Experiencescape and ERB. The specific indirect effect of Experiencescape on ERB through Place Attachment is positive and statistically significant (β = 0.063; t = 1.967; p = 0.049), with a 95% bias-corrected confidence interval of [0.011, 0.137] that excludes zero. Because the direct effect of Experiencescape on ERB is non-significant (H2) while this indirect effect is significant, the result represents an indirect-only (full) mediation according to the mediation typology described by Hair Jr et al. (2021). This finding empirically substantiates the theoretical pathway proposed in the conceptual model, in which experiential quality shapes responsible behaviour not directly, but through the emotional bond that tourists form with the destination, thereby supporting H7. Moreover, the moderated indirect effect EC × Experiencescape → Place Attachment → ERB is also significant (β = -0.039; p = 0.038), indicating a moderated-mediation mechanism in which environmental concern conditions the strength of the experiencescape-driven mediation pathway.

Discussion

Experiencescape → Place Attachment (Supported)

Experiencescape was found to significantly influence Place Attachment, confirming that the quality of the experiential environment encountered at a destination plays a meaningful role in fostering tourists' emotional and cognitive bonds with that place. This finding aligns with Kandampully et al. (2023), who argue that the physical, atmospheric, and symbolic dimensions of a destination collectively create immersive encounters that deepen visitors' sense of belonging and identification with the place.

Experiencescape → Environmentally Responsible Behaviour (Not Supported)

The direct effect of Experiencescape on ERB was not significant, suggesting that positive experiential encounters alone are insufficient to directly generate responsible environmental behaviour. This finding implies that the relationship between experience and behaviour is not straightforward but operates through mediating psychological mechanisms, particularly place attachment, rather than arising as an immediate behavioural response to the experiencescape itself.

Place Attachment → Environmentally Responsible Behaviour (Supported)

Place Attachment was confirmed as a significant driver of ERB, establishing that tourists who develop strong emotional and functional connections to a natural destination are more likely to engage in behaviours that protect and preserve that environment. This result supports Place Attachment theory, which holds that a sense of place identity and place dependence activates a psychological motivation for environmental stewardship (Arissaputra et al., 2024).

Environmental Concern × Experiencescape → Place Attachment (Supported)

Environmental Concern significantly moderated the relationship between Experiencescape and Place Attachment, though in a negative direction. This counterintuitive finding suggests that among visitors with higher environmental concern, the capacity of the experiencescape to generate place attachment is attenuated rather than amplified. A plausible explanation is that environmentally conscious tourists apply more critical evaluative standards to the ecological authenticity of their experiential environment, and when the experiencescape fails to meet those expectations, the formation of place attachment is inhibited.

Environmental Concern × Experiencescape → Environmentally Responsible Behaviour (Not Supported)

Environmental Concern did not significantly moderate the relationship between Experiencescape and ERB. Given that the direct Experiencescape–ERB path was also non-significant, the absence of a moderating effect suggests that environmental concern has no meaningful pathway to amplify a relationship that is structurally weak. This finding further reinforces that the behavioural consequences of tourism experience are channelled through emotional constructs such as place attachment rather than being directly conditioned by dispositional environmental concern.

Environmental Concern × Place Attachment → Environmentally Responsible Behaviour (Not Supported)

The moderating effect of Environmental Concern on the Place Attachment–ERB relationship was likewise not significant. This suggests that place attachment and environmental concern operate through distinct and parallel psychological pathways rather than interactively. When environmental concern remains largely attitudinal and has not been reinforced through prior conservation behaviour as evidenced by the experience profile of the sample its capacity to amplify the effect of place-based emotional bonds on responsible behaviour remains limited.

The Mediating Role of Place Attachment (Supported)

The mediation analysis provides direct evidence for the affective mechanism that the conceptual model proposes. Because Experiencescape exerts a significant indirect effect on ERB through Place Attachment ($\beta = 0.063$; $p = 0.049$) while its direct effect is non-significant, Place Attachment fully mediates the experiencescape–behaviour relationship—an indirect-only mediation in the sense described by Hair Jr et al. (2021). Substantively, this means that the quality of the experiential environment does not, by itself, prompt responsible conduct; rather, its influence is realised only once tourists develop an emotional and identity-based bond with the destination. This result reconciles the otherwise puzzling combination of a supported H1 and H3 with a rejected H2, and it reinforces the central argument that fostering deep place attachment is a more effective lever for promoting environmentally responsible behaviour than enhancing experiential quality alone. The significant moderated indirect effect involving environmental concern further indicates that this mediation pathway is itself contingent on visitors' environmental dispositions, underscoring the value of the integrated moderated-mediation model adopted in this study.

5 Conclusions and Suggestions

Conclusions

This study examined the relationships among Experiencescape, Place Attachment, Environmental Concern, and Environmentally Responsible Behaviour among tourists visiting nature-based destinations in Nusa Tenggara Barat. The findings demonstrate that Experiencescape strengthens Place

Attachment, and that Place Attachment in turn drives ERB, establishing an indirect pathway through which the quality of tourism experience ultimately influences responsible environmental conduct. However, Experiencescape was found to have no direct effect on ERB, underscoring that behavioural change does not arise spontaneously from experiential stimuli alone. Environmental Concern significantly moderated the Experiencescape–Place Attachment relationship, though in a negative direction, suggesting that environmentally conscious visitors apply more critical standards to the experiential environment they encounter. Environmental Concern did not moderate either the Experiencescape–ERB or Place Attachment–ERB relationships, indicating that dispositional environmental concern alone is insufficient to activate pro-environmental behaviour within a tourism context without the presence of deeper emotional engagement.

Suggestions

For destination managers, the findings highlight that building emotional connections between visitors and the natural environment through meaningful, interpretive, and ecologically authentic experiencescapes is more effective than relying on experiential quality alone to promote responsible behaviour. Conservation storytelling, community-based tourism programmes, and guided nature interpretation can serve as practical tools to deepen place attachment and, consequently, strengthen ERB among visitors. For policymakers, sustainable tourism frameworks in NTB should explicitly incorporate visitor behavioural change as a policy priority, supported by environmental education initiatives and sustainability standards for nature destination operators. Future research should explore longitudinal designs to examine how repeated visitation strengthens place attachment and ERB over time, and investigate additional mediating constructs such as environmental identity or moral norms that may further explain the experience behaviour relationship.

Limitations

Several limitations should be acknowledged when interpreting these findings. First, the study employed a cross-sectional design, which captures relationships at a single point in time and therefore cannot establish causal ordering or capture how place attachment and responsible behaviour evolve across repeated visits. Second, the scope was confined to nature-based destinations within a single province (NTB), so the results may not be fully generalisable to other regions or tourism contexts. Third, the data relied on self-reported perceptions collected through purposive sampling, which may introduce social-desirability and common-method considerations despite the favourable collinearity diagnostics reported above. Finally, the model focused on a specific set of psychological constructs; other relevant factors—such as environmental identity, moral norms, and destination-specific governance—were not included. Future research adopting longitudinal or experimental designs, multi-province samples, and behavioural (rather than self-reported) measures would help address these limitations and strengthen the external validity of the findings.

Acknowledgment

The authors would like to express their sincere gratitude to Politeknik Pariwisata Lombok for the institutional support provided throughout the course of this research. The academic environment, resources, and encouragement offered by the institution have been instrumental in facilitating the completion of this study

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