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CONSUMER BEHAVIOR| RESEARCH ARTICLE

Enhancing Tourists' Environmentally Responsible Behavior at Zero-Waste Destinations: The Moderating Role of Environmental Facilitating Conditions

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Abstract:
Background: Environmental damage caused by visitor waste has become a critical issue, especially at zero-waste tourist sites. Therefore, understanding tourists' Environmentally Responsible Behavior (ERB) is essential.
Purpose: This study aimed to investigate the factors influencing ERB in zero-waste tourism.
Method: This quantitative study adopted the Value-Attitude-Behavior (VAB) theory to examine relationships among variables related to tourists' ERB at zero-waste destinations. Data were purposively collected from 300 tourists of zero-waste destinations in Batu City, East Java. They were then analyzed using structural equation modelling (SEM) with SmartPLS.
Findings: The results indicate that environmental concern and environmental knowledge significantly shape tourists' ERB, while place attachment does not. Both environmental attitude and environmental subjective norm strongly influence ERB. Moderation analysis reveals that the Environmental Facilitating Condition (EFC) significantly strengthens the relationship between environmental attitude and ERB, but not between subjective norm and ERB.
Conclusions: This research contributes by integrating VAB theory with EFC as a moderator in the context of zero-waste tourism. It demonstrates that positive environmental attitudes and adequate facilities could significantly build responsible tourist behavior. Meanwhile, emotional attachment to a certain place is less influential.
Research implication: These findings suggest that destination managers and policymakers simultaneously enhance environmental awareness and upgrade facilities or support systems. They should invest in both educational interventions and practical infrastructure to promote sustainable behavioral changes towards environmentally responsible tourism.

Keywords: environmental attitude, environmental facilitating condition, environmentally responsible behavior, environmental subjective norms, zero waste tourism

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PUBLIC INTEREST STATEMENT

Tourism destinations that adopt zero-waste principles depend not only on managerial systems but also on the willingness of visitors to behave responsibly toward the environment. However, in practice, many tourists struggle to translate their environmental awareness into real actions due to limited knowledge, weak social encouragement, and inadequate supporting facilities. This study reveals that when tourists are equipped with sufficient environmental understanding and supported by clear, accessible waste management infrastructure, their positive attitudes can significantly transform into concrete, responsible behaviors—such as sorting waste, protecting local ecosystems, and encouraging others to do the same. These findings underscore a crucial message for policymakers and destination managers: sustainable tourism will only be achieved when education, social engagement, and enabling facilities are strengthened. It creates environments where responsible choices are easy and natural for every visitor.

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1. Introduction

Over the past two decades, globalization has brought substantial influence by increasing environmental pressure, which has prompted much research on the interaction of human nature (Chiu et al., 2013). Many people believe that human activities cause environmental problems (Cheng & Wu, 2015; Chiu et al., 2013). On this basis, research on the human-nature relationship can prompt actions that may harm the environment (Scannell & Gifford, 2010). Many researchers have argued about the environment, their perceptions of it, the relationship with places, and their predictions about environmental behavior (Kollmuss & Agyeman, 2002). Human behavior can be altered to manage and resolve environmental sustainability (Solekah et al., 2022). Both managers and scholars have been committed to encouraging visitors to participate in ERB at tourist sites for sustainable development (Han et al., 2018).

Until now, the tourism industry continues to debate the issue of waste at tourist sites. The accumulation of waste in tourist areas leads to air and marine ecosystem pollution, which directly affects human health. If this waste is left unattended, it can have adverse effects in the future. Environmental preservation is everyone's responsibility, including visitors, local communities, and tourism managers. Waste will pile up at tourist sites, polluting the environment. In fact, some tourist destinations in Indonesia have been destroyed as a result. According to data, six natural tourist sites in Indonesia are threatened by waste-related damage: Kuta Beach in Bali, Bunaken National Marine Park, Sempu Island, Ranu Kumbolo, Mount Gede Pangrango, and Sarangan Lake (Fidareni, 2018). These natural tourist sites are experiencing such conditions because visitors lack awareness of proper waste disposal (Fidareni, 2018).

Everyone acknowledges that waste is a problem, especially for tourism operators. Without proper management, a large number of tourist visits can cause waste problems. However, it differs from PT Selecta, one of Indonesia's famous tourist destinations. Selecta has been chosen as the first tourist destination in Indonesia to achieve zero waste and offer waste management training. They have successfully achieved the zero-waste target for the past three months. They do not send their waste to temporary disposal sites, landfills, or any other waste disposal locations by applying reuse, reduction, and treatment of inorganic waste. Organic waste, on the other hand, is processed into compost and liquid fertilizer for plants and fish feed. The measures align with the Ministry of Tourism and Creative Economy's policy, which promotes eco-friendly travel. The Ministry defines sustainable tourism as a tourism site that meets the demands of tourists, businesses, the environment, and local communities while considering the present and future economic, social, and environmental implications. It applies to all kinds of tourist locations, including mass tourism and other kinds of activities (Ayu, 2024).

Studies found that ERB, especially among tourists, is impactful on the natural environment at either the destination or the global sphere (Lee et al., 2013). This behavior is influenced by both internal (individual) and external (tourism destination stimuli) factors. Consumers who exhibit ERB act differently from general buyers because their choices are guided more by values and environmental responsibility than by personal benefits or enjoyment (Zarei & Mirzae, 2022). To follow Inskeep's recommendations on selective marketing, it is necessary to explain the groups of tourists who demonstrate environmentally friendly behavior, because some tourists are highly environmentally conscious (Dolnicar & Leisch, 2008).

For sustainable tourism growth, understanding the components influencing tourists' ERB is important. Researchers suggested that the construction of recreational experience learning can provide educational opportunities to teach tourists about ERB during

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recreational visits (Lee & Jan, 2019). The relationship among environmental attitudes, perceptions, place attachment, and ERB has been discussed in several studies. Hines et al. (1987) examined the relationship only between attitudes and environmental behavior, excluding other aspects such as environmental perceptions and place attachment. They found that environmental knowledge is the most important predictor of ERB, while gender is the least important. Undoubtedly, ERB can predict sustainable tourism growth (Zhao et al., 2018), but its impact can be undermined by residents' limited awareness of their involvement and contributions to community development and environmentally responsible practices. Recently, Akinjokun et al. (2018) and Dlamini et al. (2020) examined the predictive strength of socio-demographic variables and identified that place attachment and satisfaction with water and waste management are the strongest predictors of environmental attitude.

Similarly, environmental concern is a positive predictor of environmental attitude (Sathish & Thiruchelvi., 2024; Sultan et al., 2021). Pro-environmental attitude is also greatly influenced by environmental knowledge (Fang et al., 2018; Solekah et al., 2023; Go et al., 2020). Environmental concern and environmental knowledge positively and significantly influence sustainable consumption (Mahliza et al., 2025). Several previous studies have shown that environmental attitude is a good predictor in shaping ERB (Liu et al., 2021; Lu et al., 2023; Sultan et al., 2021). Wang et al. (2024) found that tourists' ERB is influenced by situational environmental education through habits and subjective norms. Similarly, Bülbül (2024) and Wang et al. (2018) found that ESN is a predictor of ERB. Go et al. (2020) identified that facility conditions strengthen tourists' ERB influenced by environmental attitude, but not by subjective norm. This result contrasts with that of Wang et al. (2023), who successfully identified the role of facilitating conditions as a moderating variable between subjective norm and ERB. Therefore, this study re-examines how EFC in zero-waste tourism can strengthen ERB influenced by tourists' attitudes and subjective norms when visiting zero-waste tourism destinations.

Although ERB has been widely examined in tourism studies, existing research has primarily focused on individual psychological determinants, such as environmental concern, knowledge, attitudes, and subjective norms, grounded in the Theory of Planned Behavior (TPB) and Value–Attitude–Behavior (VAB) frameworks. These studies consistently confirm the importance of ERB, yet they often overlook the attitude–behavior gap, assuming that favorable attitudes automatically lead to responsible actions. Recent studies have begun to incorporate EFC as contextual enablers of ERB; however, findings remain inconclusive, particularly regarding their moderating role in the relationships between attitude to ERB and subjective norm to ERB. Moreover, most studies have been conducted in a general ecotourism or mass tourism setting. Meanwhile, responsible behavior is dependent on both tourists' values and the availability of supportive infrastructure. Empirical evidence from developing-country settings remains scarce.

In addition, the role of place attachment in zero-waste tourism, especially when the attachment is shaped by functional environmental management attributes such as water, sanitation, and waste systems, has received limited empirical attention. To address these gaps, this study extends the VAB framework by integrating EFC as a moderating variable. By examining these relationships in a fully operational zero-waste tourism destination in Indonesia, this research provides context-specific evidence that refines existing ERB models and clarifies the conditional role of facilitating environments in promoting sustainable tourist behavior.

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Recent studies have begun to incorporate EFC as contextual enablers of ERB; however, findings remain inconclusive, particularly regarding their moderating role on the attitude–ERB and subjective norm–ERB relationships. Moreover, most prior studies have focused on general ecotourism. Empirical evidence from developing countries is scarce. This research is expected to contribute to the tourism industry, particularly regarding tourists' behaviors at zero-waste tourist destinations, which require considerable care to maintain the sustainability of their ecosystems. In addition, it is expected to serve as a reference for zero-waste tourist destination managers to improve their management in meeting tourists' expectations.

2. Literature Review

The current study introduces the VAB theory as a theoretical framework, followed by a review of relevant literature on place attachment, environmental concern, environmental knowledge, environmental attitude, and ERB. EFC is incorporated as a moderating variable to examine its potential to strengthen tourists' responsible behavior at zero-waste tourism destinations. The literature is presented in subchapters: the theory used, the variables studied, and the relationships among them, which culminate in a hypothesis.

2.1 Theoretical Review

2.1.1 The Value-Attitude-Behavior Theory (VAB)

The value-attitude-behavior (VAB) theory, introduced by Homer and Kahle (1988), posits that values shape behaviors through attitudes. Values represent strong moral beliefs that guide perceptions and actions (Nazirova & Borbala, 2024; Cheung et al., 2020). Alongside the VAB model, other approaches often used to understand human behavior include the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) and the theory of planned behavior (TBP). Human values, which are the heart of human life, can influence tourists' behavior in environmental protection. Values represented by environmental concern, which consists of concern for the biosphere and concern for the self, are developed to refine VAB theory. These theories build on one another. Later, Ajzen (1991) extended this model by introducing the perceived behavioral control, which became the foundation of TPB. According to TPB, one's intention to perform a certain behavior can be predicted through their attitudes, subjective norms, and perceived behavioral control. TPB is an important theoretical basis for explaining ERB, such as environmentally responsible tourists (Panwanitdumrong & Chen, 2021).

To explain ERB in the context of zero-waste tourism, this study uses VAB. Place attachment (emotional cognitive) and environmental attitudes (affective judgments of ERB) are fostered by environmental knowledge (cognitive comprehension of concerns) and environmental concern (value orientation toward protection). The route to real activities, such as sorting and trash minimization, is then mediated by attitudes. We include EFC, such as amenities and signage, as a moderator to increase attitude-ERB and norm-ERB linkages because VAB ignores external limitations. For a more complex understanding of tourists' ERB, this integrated model strikes a balance between contextual facilitators and interior psychology.

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2.1.2 Environmentally Responsible Behavior (ERB)

In the literature, ERB is defined as the actions and habits of individuals or groups that involve understanding and learning about attitudes and responsibilities toward the environment. However, many studies have investigated the factors that predict ERB and its impact on economic growth (Cheng et al., 2019). When it comes to leisure or travel, environmentally conscious tourists minimize adverse effects on the biosphere and ecosystems of tourist sites (Lee et al., 2013). The sustainable development of tourist destinations is further affected by environmental quality, which is strongly influenced by visitors' environmentally conscious behavior (Cheng et al., 2019; Han et al., 2016).

2.2 Relationship between Place Attachment and Environmental Attitude

There has been much debate about the relationship between people and place attachment. Place attachment can be considered as an individual's emotional, cognitive, and functional connection with a specific place or location (Lewicka, 2011a). To explain tourists' visit intentions, Hosany et al. (2020) used the terms ‘place identity and place dependence’. Academics have regarded place attachment as a multidimensional construct that combines place identity, place dependence, place affect, and social bonds to assess an individual's emotional connection with a particular place (Ramkissoon et al., 2018). In the context of this study, three indicators are used: perception of water management, sanitation, and waste (Dlamini et al., 2020). Akinjokun et al. (2018), Dlamini et al. (2020), as well as Xie and Wang (2024) assessed the predictive potential of socio-demographic variables on environmental perception, attitude, and place attachment, but have not examined how they could predict ERB. Dlamini et al. (2020) found that one of the highest predictors of attitude is satisfaction with water and waste disposal.

This study adopts the VAB theory, which explains that attitudes toward specific behaviors emerge from underlying evaluative orientations shaped by both abstract values and contextual experiences (Homer & Kahle, 1988). Within this perspective, values do not directly drive behavior but are translated into behavior-relevant evaluations through attitudes. In zero-waste tourism, place attachment to water management, sanitation, and waste removal systems reflects an evaluative orientation shaped by tourists’ direct interactions with destination-level environmental management. This form of attachment captures tourists’ cognitive and affective appraisal of the effectiveness and visibility of environmental infrastructure. According to VAB, environmental attitude represents the evaluative mechanism through which such value orientations are articulated into judgments about ERB. Therefore, tourists who are strongly attached to environmental systems tend to evaluate environmentally responsible actions leading to positive environmental attitudes (Homer & Kahle, 1988; Stern, 2000).

H1: The perception of place attachment to water management, sanitation, and waste removal affects tourists' environmental attitudes in zero-waste tourism.

2.3 Relationship between Environmental Concern and Environmental Attitude

Sathish and Thiruchelvi. (2024) found that responsible tourism is strongly embraced by individuals with a positive environmental attitude, who demonstrate ERB, and who are concerned with sustainability. On the other hand, Schultz (2000) proposed that environmental concern (EC) has three correlated factors: concern for self (egoistic), concern for others (altruistic), and concern for the biosphere. Solekah et al. (2023) found that EC positively impacts tourists' attitudes toward Muslim-friendly tourist destinations in Indonesia.

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EC significantly influences one's attitudes toward environmentally responsible activities (Chen et al., 2020). Sultan et al. (2021) found that environmental concern affects the environmental attitudes of tourists visiting coastal tourism areas at the world's longest sandy beach, Cox's Bazar, Bangladesh.

H2: Environmental concern (for both the biosphere and the self) influences tourists' environmental attitudes toward zero-waste tourism.

2.4 Relationship between Environmental Knowledge and Environmental Attitude

Burchett (2015) defines EK as "the evaluation of an individual's understanding of the interaction between humans and the environment from the perspective of environmental issues, mental health, and associations within the ecological system." Fang et al. (2018) researched students in Taiwan and China to determine whether environmental knowledge can influence ERB. To investigate the differences between students' knowledge of the environment, their environmental perceptions, and their behavioral intentions toward ecotourism, they used a structural equation model. They found that behavioral intention and support, or knowledge-attitude-behavior, are significantly related to EK. Solekah et al. (2023) found that EK has a positive effect on the environmental attitudes of tourists who visit Muslim-friendly tourist destinations in Indonesia. Similarly, Ramdas et al. (2021) found that EK influences tourists' environmental attitudes during their visit to Perhentian Island, Malaysia. Kement et al. (2021) demonstrated that tourists' ERB is shaped by cognitive, affective, and attitudinal factors. Therefore, sustainable tourism destination management should address not only knowledge but also emotions and attitudes to build pro-environmental actions among visitors.

H3: Environmental knowledge, which consists of sustainable development knowledge and environmental protection knowledge, affects tourists' environmental attitudes in zero-waste tourism

2.5 Relationship between Environmental Attitude and Environmentally Responsible Behavior

Lu et al. (2023) analyzed various factors influencing the ERB of Gen Y and Z tourists in Taiwan, Thailand, and Vietnam. The research suggested that the environmental attitudes of Gen Y and Z in these three countries significantly shape ERB. Ho and Tan (2021) studied millennial tourists in Singapore and showed that their positive attitudes arising from tourism experiences influence their attitudes towards tourist destinations and affect their intention to exhibit ERB. Liu et al. (2021) found that tourists' attitudes towards ERB, environmental issues, and perceived consumer effectiveness influence their behavior. Similarly, Sultan et al. (2021) identified that environmental attitudes shape responsible behavior among tourists visiting coastal destinations in Bangladesh.

H4: Environmental attitude influences tourists' ERB at zero-waste tourism

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2.6 Relationship between Environmental Subjective Norm and Environmentally Responsible Behavior

Consumers, according to Ajzen (1991), directly feel the expectations of the people around them and strive to seek social approval by doing what others expect of them. Bülbül (2024) found that religious subjective norms have a significant impact on other planned behavior structures and indirectly influence pro-environmental actions at home, in the supermarket, and in other public places. Wang et al. (2018) found that tourists' ERB is influenced by their perceptions of environmental behavior and subjective norms.

H5: Environmental subjective norm affects environmentally responsible behavior in zero-waste tourism.

2.7 Environmental Facilitating Condition Moderated the Relationship between Environmental Attitude and Environmentally Responsible Behavior

Previous research has established a positive relationship between environmental attitude and ERB among tourists, with EFC as a moderator. Go et al. (2020) explicitly found that EFC moderates the relationship between environmental attitude and ERB among tourists, referring to the frameworks of the Theory of Planned Behavior and Value–Attitude–Behavior. Other studies by Cao et al. (2022) as well as Aziz and Niazi (2023) also highlight the roles of situational factors and physical facilities in translating pro-environmental attitudes into responsible behavior in the tourism sector. A recent literature review by Gautam and Bhalla (2023) confirms that the influence of environmental attitude on responsible behavior is enhanced when supported by destination facilities and policies that encourage pro-environmental actions. Go et al. (2020) found that facilitating conditions can moderate the relationship between environmental attitude and ERB. This finding shows that EFC, as one external factor, influences ERB.

H6: EFC moderates the relationship between environmental attitude and environmentally responsible behavior of tourists at zero-waste tourism.

2.8 Environmental Facilitating Condition Moderates the Relationship between Environmental Subjective Norm and Environmentally Responsible Behavior

Research has consistently indicated that subjective norm is a determinant within the TPB framework. Recent studies show that this relationship is strengthened when environmental facilitating conditions (such as supporting infrastructure, community norms, or environmental policies) are present as moderators. Tian & Jiang (2025) found that ecological environmental risk perception positively moderates the relationship between subjective norm and ecological protection behavior. Ogiemwonyi (2024) and Hansen et al. 2024) reported that facilitating conditions, such as community engagement, environmental resources, and organizational support, also improve the influence of subjective norms on green and sustainable behaviors across tourism settings. Go et al. (2020) found that facilitating conditions cannot moderate ESN on ERB. Open-ended findings by Saleem et al. (2021) and Rahimian et al. (2025) confirm the role of social influence and facilitating conditions in encouraging tourists to exhibit ERB. Therefore, it is hypothesized that:

H7: Environmental facilitating condition moderates the relationship between environmental subjective norm and tourists' environmental responsible behavior in zero-waste tourism.

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3. Conceptual Framework

This study's framework integrates the VAB model and TPB. It proposes that place attachment, environmental concern, and environmental knowledge shape environmental attitudes. These attitudes, along with subjective norms, drive ERB. Crucially, EFC serves as a moderator, strengthening the relationship between attitude, subjective norm, and ERB. This model shows the cognitive and contextual determinants and empirically tests how external supports mediate the influence of individual values and knowledge on sustainable tourist behavior. It proposes the conceptual research model in Figure 1.

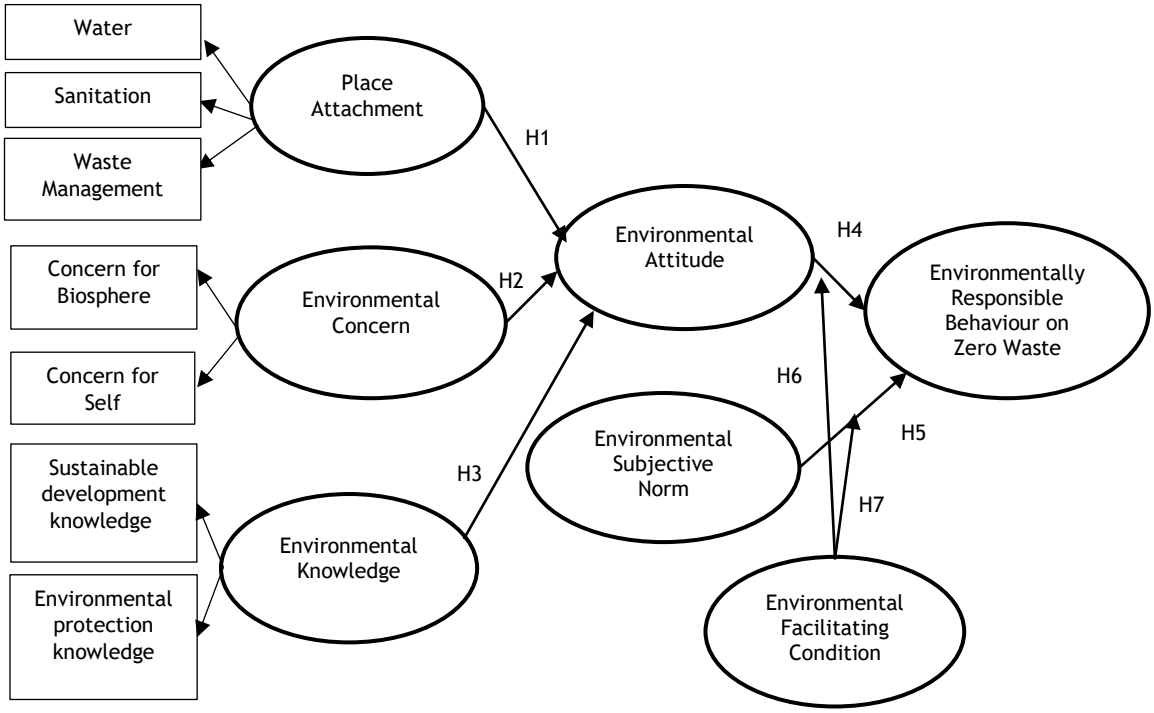

Figure 1. The conceptual framework of ERB in zero-waste tourism: ERB is influenced by environmental attitude, environmental subjective norm; environmental attitude is influenced by place attachment, environmental concern, and environmental knowledge

The hypotheses of this study are as follows:

H1: The perception of place attachment to water management, sanitation, and waste removal affects tourists' environmental attitudes in zero-waste tourism

H2: Environmental concern (for both the biosphere and the self) influences tourists' environmental attitudes toward zero-waste tourism

H3: Environmental knowledge, which consists of sustainable development knowledge and environmental protection knowledge, affects tourists' environmental attitudes in zero-waste tourism

H4: Environmental attitude influences tourists' ERB at zero-waste tourism

H5: Environmental subjective norm affects ERB in zero-waste tourism

H6: EFC moderates the relationship between environmental attitude and tourists' ERB at zero-waste tourism

H7: EFC moderates the relationship between place attachment and tourists' ERB in zero-waste tourism

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4. Methods

4.1 Research Design

This study employed a quantitative research design with a survey approach to examine the relationships among place attachment, environmental concern, environmental knowledge, environmental attitude, environmental subjective norm, EFC, and ERB in the context of zero-waste tourism.

This research was conducted at Selecta Recreational Park in Batu City, East Java, Indonesia. PT Selecta, one of Indonesia's well-known tourist destinations, was the first to be designated a zero-waste tourism site. It has ten waste management facilities: the Selecta Garden, handicraft products, briquette management, HD plastic bag processing, cardboard processing, economic value of plastic, animal feed, liquid fertilizer, compost fertilizer, and residual waste management. Waste management aligns with the Ministry of Tourism and Creative Economy's policy, which promotes sustainable tourism. Since this study relied on self-reported survey data to examine psychological constructs, the potential for common method bias (CMB) was assessed. Following established methodological practice, Harman's single-factor test was employed to evaluate whether a single latent factor accounted for the majority of covariance among the measurement items (Podsakoff et al., 2003). All measurement items were entered into an exploratory factor analysis using an unrotated principal component solution. The results show that multiple factors emerged, with the first factor accounting for 31.4% of the total variance, below the recommended threshold of 50%. It indicated that CMB should not pose a serious threat to the validity of the findings.

4.2 Sampling

This research involved tourists who had visited or were currently visiting zero-waste tourist attractions in Malang. The researchers used purposive sampling because the exact population size was unknown. Also, purposive sampling was used to ensure that respondents possessed relevant experiential knowledge of the research context. Only tourists who had visited the zero-waste tourism destination and had direct exposure to environmental management attributes, including water management, sanitation, and waste removal systems, were included. These criteria are essential because psychological constructs, such as place attachment, environmental attitude, and ERB, require direct interaction with the destination to be meaningfully evaluated (Han et al., 2016; Yoon et al., 2024).

The sample size in this study was determined based on established structural equation modeling (SEM) guidelines that relate sample adequacy to the number of observed indicators. Following the recommendation of Hair et al. (2019), a minimum sample size of 5–10 observations per indicator is required to ensure reliable parameter estimation. This study employed 49 measurement indicators, so a minimum sample size of 245 respondents (49 × 5) was required. To exceed this methodological threshold and enhance the robustness of the analysis, data were collected from 300 respondents. Accordingly, the final sample size was considered sufficient and appropriate for hypothesis testing and model estimation. The questionnaire distribution took data from 300 respondents who met the criteria and were obtained for further processing.

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4.3 Measurement

Construct reliability was evaluated using Cronbach's alpha, with a standardized loading factor of >0.70. According to Hair et al. (2019), each item's factor loading is significant and important when the standard factor loading exceeds 0.70. The validity and reliability of the observational variables are presented in Table 1. The variables were measured using indicators from earlier research, with some modifications to better fit the particular setting of this study. PA was measured through three dimensions: water, sanitation, and waste management, adapted from Cheng et al. (2014) and Lin et al. (2019), with 15 indicators using a 1-5 Likert scale. EC was measured with two dimensions: Concern for the Biosphere and Concern for Self, using six indicators adapted from Schultz (2001) and Sultan et al. (2020). EK was measured with two dimensions, namely sustainable development knowledge and environmental protection knowledge, using nine indicators adapted from Cheng et al. (2014). ESN was measured using three indicators adapted from Wang et al. (2019). Environmental attitude was measured using seven indicators adapted from Lu et al. (2023). EFC was measured using nine indicators adapted from Cronan and Al-Rafee (2008). ERB was measured with 10 indicators adapted from Lu et al. (2023).

Table 1. Operational definition and indicators of ERB in zero-waste tourism

No	Variables	Operational Definition	Item	Loading Factor	Scale
1	Place Attachment (PA) (Lewicka, 2011; Raymond, 2010)	PA is the term used to describe a person's emotional, cognitive, and functional attachment to a place or site, such as a zero-waste tourism destination.	Place Attachment Water In my opinion, good water management at zero-waste tourist destinations leads to: 1) This place is meaningful to me 2) I feel compelled to visit here 3) Strong identification with visiting here 4) Enjoy visiting here more than other places 5) Gain more satisfaction here than in other places	 0.858 0.853 0.886 0.889 0.902	1-5 Scale adapted from (Cheng et al., 2014; Lin & Chen, 2019)
			Place Attachment Sanitation In my opinion, proper sanitation management at zero-waste tourist destinations leads to: 1) This place is meaningful to me 2) I feel compelled to visit here 3) Strong identification with visiting here 4) Enjoy visiting here more than other places 5) Gain more satisfaction here than in other places	 0.887 0.871 0.922 0.925 0.909	1-5 Scale adapted from (Cheng et al., 2014; Lin & Chen, 2019)

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Table 1. Operational definition and indicators of ERB in zero-waste tourism (Continue)

No	Variables	Operational Definition	Item	Loading Factor	Scale
1	Place Attachment (PA) (Lewicka, 2011; Raymond, 2010)	PA is the term used to describe a person's emotional, cognitive, and functional attachment to a place or site, such as a zero-waste tourism destination.	Place Attachment Management Waste In my opinion, good waste management at zero-waste tourist destinations leads to: 1) This place is meaningful to me 2) I feel compelled to visit here 3) Strong identification with visiting here 4) Enjoy visiting here more than other places 5) Gain more satisfaction here than in other places	 0.885 0.901 0.928 0.925 0.913	1-5 Scale adapted from (Cheng et al., 2014; Lin & Chen, 2019)
2	Environmental Concern (EC) (Hansla et al., 2008; Rhead et al., 2015)	EC is defined as the evaluation of environmental issues and the perception and environmental attitudes of individuals or tourists towards zero-waste tourism destinations	Concern for Biosphere 1) I am worried that natural resources will be destroyed by tourists 2) I am concerned about tourists bringing home special plants, stones, rocks, insects, small animals, etc. 3) I am concerned about ecological conservation at the zero-waste tourist destinations I visit. Concern For Self 1) I am concerned about how my way of living affects zero-waste tourist destinations' ecosystems 2) The long-term viability of zero-waste tourism locations depends heavily on environmental sustainability 3) I am worried that tourists will greatly abuse the environment of zero-waste tourist destinations.	 0.885 0.903 0.842 0.877 0.906 0.855	1-5 Scale Adapted from (Schultz, 2001; Sultan et al., 2021)

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Table 1. Operational definition and indicators of ERB in zero-waste tourism (Continue)

No	Variables	Operational Definition	Item	Loading Factor	Scale
3	Environmental Knowledge (Burchett, 2015)	EK is the evaluation of a person's comprehension of how humans interact with their surroundings from the standpoint of environmental problems and different connections within the ecological system	Sustainable development knowledge		1-5 Scale Adapted from (Cheng & Wu, 2015)
			1) I am aware that preserving ecological balance will improve zero-waste tourist destinations' sustainable growth	0.894	
			2) I am aware that we need to preserve the natural resources of zero-waste tourist locations for the sake of future generations	0.889	
			3) I know that preserving species diversity at zero-waste tourist destinations will balance the ecology	0.921	
			4) I am aware that land at zero-waste tourist sites will be consumed by the intensive development of natural resources	0.790	
			Environmental protection knowledge		1-5 Scale adapted from (Cheng & Wu, 2015)
			1) I am aware that overindulging in recreational activities will harm the destination's ecosystem	0.817	
			2) I am aware that zero-waste tourist locations would be contaminated by carbon dioxide emissions from vehicles and motorcycles	0.871	
			3) I am aware that significant tourism growth will jeopardize the environment and natural resources.	0.883	
			4) I know that, during travel, using green utensils, such as bowls and chopsticks, will prevent environmental damage at zero-waste tourist destinations.	0.850	
			5) I know that cycling or public transit can help reduce air pollution in tourist locations with zero waste	0.831	

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Table 1. Operational definition and indicators of ERB in zero-waste tourism (Continue)

No	Variables	Operational Definition	Item	Loading Factor	Scale
4	Environmental Attitude (Milfont & Duckitt, 2010)	A psychological inclination manifested in a person's assessment of a certain item or environmental problem	1) I think of myself as an environmentally conscientious individual	0.808	1-5 Scale adapted from (Lu et al., 2023)
			2) In natural biological zones, visitors are not permitted to gather plants, animals, insects, or stones	0.842	
			3) Visitors who encounter a specific species need to report to the management unit on site.	0.818	
			4) I'm concerned about how ecotourism will impact the local ecosystem	0.755	
			5) Tourist ecotourism activities greatly help protect the local environment.	0.825	
			6) Preserving the ecosystem is crucial for future generations	0.710	
			7) Local economic development benefits from ecotourism operations	0.860	
5	Environmental Subjective Norm (Ajzen, 1991)	The expectations from people around the tourists that they directly perceive and strive for social approval by doing what others expect of them	1) My significant others believe that I should safeguard the environment at zero-waste tourist destinations.	0.926	1-5 Scale Adapted from (Wang et al., 2019)
			2) People who highly respect hope that I can protect the environment at zero-waste tourist destinations.	0.934	
			3) People I know will participate in environmental protection at zero-waste tourist attractions.	0.857	
6	Environmental Facilitating Condition (Triandis, 1980)	The driving factor that motivates individuals to reflect on their behavior in the environment	In my opinion, the Selecta Batu recreational park:		1-5 Scale Adapted from (Cronan & Al-Rafee, 2008)
			1) Providing trash bins in various locations	0.873	
			2) Saving water usage in the services provided	0.829	
			3) Managing its business waste properly	0.915	
			4) Provide trash bins that separate organic and non-organic waste.	0.883	
			5) Managing waste into craft products	0.899	
			6) Properly managing briquette waste	0.917	
			7) Managing HD creases properly	0.922	

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Table 1. Operational definition and indicators of ERB in zero-waste tourism (Continue)

No	Variables	Operational Definition	Item	Loading Factor	Scale
6	Environmental Facilitating Condition (Triandis, 1980)	The driving factor that motivates individuals to reflect on their behavior in the environment	8) Managing cardboard waste properly	0.929	
			9) Managing food waste into animal feed, liquid fertilizer, and compost fertilizer	0.920	
7	Environmental Responsible Behavior (Cheng et al., 2019)	ERB is defined as the actions and habits of individuals or groups that involve understanding and learning about attitudes and responsibilities towards the environment, which play an important role in the development of sustainable tourism	1) I will comply with the control policies on site and will not enter restricted areas.	0.852	1-5 Scale adapted from (Lu et al., 2023)
			2) I will sort the trash at the place.	0.838	
			3) I'll contribute to preserving the local environment's quality	0.891	
			4) I will tell my friends or others to take care of the environment around zero-waste tourist destinations.	0.896	
			5) When required, I will cease traveling to certain places to preserve the environment and the ecology of tourism	0.886	
			6) I (inspire others) to clean up the rubbish of others	0.728	
			7) I won't purposefully harm any plants or animals	0.817	
			8) I'll report any harm to the environment or management	0.835	
			9) I choose to buy environmentally friendly products or services on this journey.	0.834	
			10) The area will be just as clean when I depart after lunch	0.862	

4.4 Data Collection

The data for this study were collected using a quantitative survey method with a structured questionnaire as the primary instrument. The study population comprised tourists currently visiting or having previously visited the zero-waste tourist destination in Batu City, East Java, Indonesia. The research employed a non-probability purposive sampling technique, where participants were selected based on specific criteria: (1) a minimum age of 15 years old, and (2) experience visiting the zero-waste tourist site in question. This timeline included preparatory activities, distribution and administration of the survey, and subsequent data compilation and processing.

Data was gathered using a self-administered questionnaire distributed directly to the qualifying respondents at the tourist locations and via online forms. The choice of self-administered questionnaires is flexible and replicable by future researchers, thereby eliminating the need for face-to-face interaction and enabling a broad geographic reach. Respondents completed the questionnaire independently, either on-site at the

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destination or remotely through an online link distributed via messaging applications and social media. Before being distributed, the questionnaire underwent validity and reliability testing to ensure clarity and measurement accuracy. Enumerators received brief training to standardize data collection procedures and minimize potential bias. Throughout the process, responses were monitored for completeness and consistency. In total, 300 valid responses were collected and included in the final analysis, exceeding the minimum recommended sample size for Structural Equation Modeling (SEM) as per Hair et al. (2019).

4.5 Data Analysis

Data analysis was conducted using descriptive statistics to summarize respondent characteristics and variable means, and SEM-PLS to test the research model and hypotheses. The descriptive analysis addressed respondent demographics and variable distribution; the convergent and discriminant validity, as well as reliability tests ensured instrument quality. The relationships between place attachment, environmental concern, and environmental knowledge on environmental attitude, as well as the impact of environmental attitude and environmental subjective norm on ERB, with EFC tested as a moderating variable. This analytic approach enabled hypothesis testing for direct and moderating effects in accordance with all study objectives.

5. Findings

5.1 Sample Characteristics

Table 2 presents the demographic characteristics of respondents who participated in this study. This table describes respondents' profiles by gender, age, occupation, monthly expenditure, and frequency of visits in a year. In this study, females make up 67% of the respondents, and male 33%. The majority of them are young, mostly between the ages of 15 and 25 (77%), with smaller percentages in the 26–35 (8.7%), >45 (8.7%), and 36–45 (5.7%) age groups. Regarding occupation, most respondents are students (74.3%), with civil servants at 11%, self-employed at 7.3%, private employees at 3.3%, and others at 4%. In terms of visits, most respondents have visited tourist destinations 1–3 times (63.7%). The remaining 18.7% have visited 3–5 times, and 17.6% have visited more than 5 times.

Table 2. Demographic profile and characteristics of survey respondents at zero-waste tourism destinations

Demographic	Category	n	Percentage
Gender	Female	201	67
	Male	99	33
Age	15-25 years	231	77
	26-35 years	26	8.7
	36-45 years	17	5.7
	>45 years	26	8.7
Occupation	Self-employed	22	7.3
	Private employees	10	3.3
	Civil servants	33	11
	Students	223	74.3
	Others	12	4
Frequency of visits	1-3 Times	191	63.7
	3-5 Times	56	18.7
	>5 Times	53	17.6

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5.2 Convergent Validity

The study first evaluated convergent validity, as Table 3 and Figure 2 show, demonstrating a substantial correlation between the items examined and valid convergent validity. A variable exhibits good construct validity if its Average Variance Extracted (AVE) is greater than 0.50, according to Hair et al. (2019). A measurement model is considered dependable if its Composite Reliability (CR) in PLS analysis exceeds 0.70. The highest weight significance value indicates important components. The study found that all variables had AVE values above 0.5 and composite reliability above 0.7, indicating good construct validity for the latent variable.

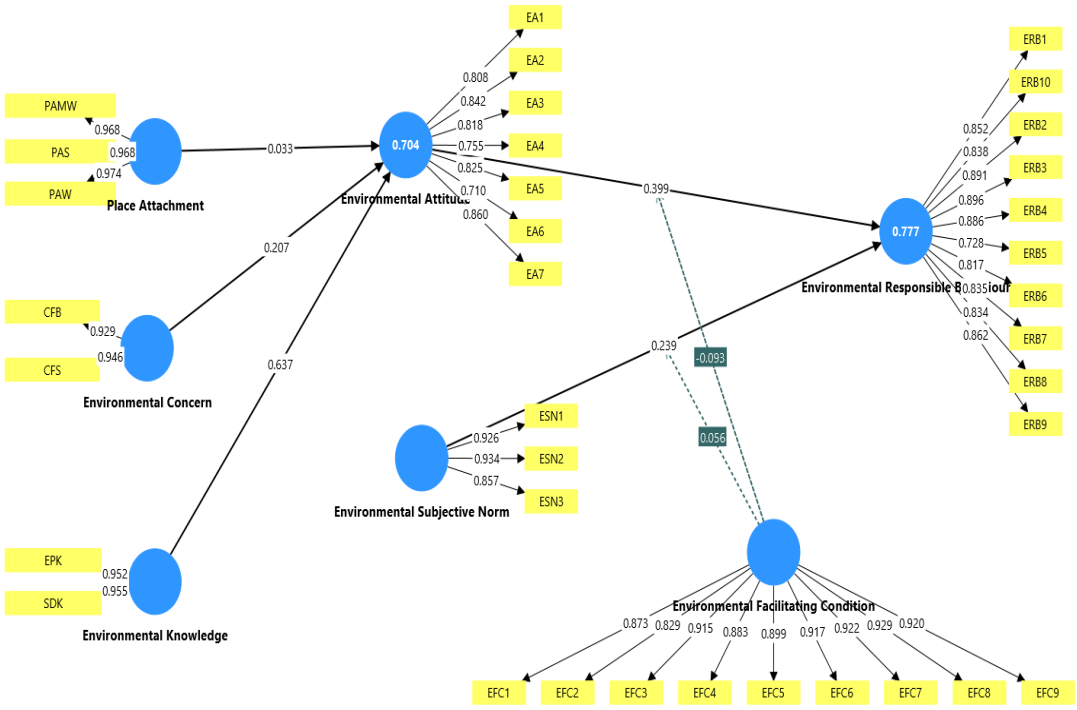

Figure 2. Outer loadings of the modified models for the role of ERB in zero-waste tourism

Table 3. The average variance extracted and composite reliability

No	Variables and Dimension	Item	AVE	CR
1	Place Attachment Water	PAW1, PAW2, PAW3, PAW4, PAW5	0.770	0.944
2	Place Attachment Sanitation	PAS1, PAS2, PAS3, PAS4, PAS5	0.815	0.957
3	Place Attachment Management waste	PAMW1, PAMW2, PAMW3, PAMW4, PAMW5	0.829	0.960
4	Concern For Biosphere (CFB)	CFB1, CFB2	0.769	0.909
5	Concern For Self (CFS)	CFS1, CFS2, CFS3	0.774	0.911
6	Sustainable Development Knowledge (SDK)	SDK1, SDK2, SDK3, SDK4	0.766	0.929
7	Environmental Protection Knowledge (EPK)	EPK1, EPK2, EPK3, EPK4, EPK5	0.724	0.929
8	Environmental Attitude (EA)	EA1, EA2, EA3, EA4, EA5, EA6, EA7	0.647	0.927
9	Environmental Subjective Norm (ESN)	ESN1, ESN2, ESN3	0.821	0.932
10	Environmental Facilitating Condition (EFC)	EFC1, EFC2, EFC3, EFC4, EFC5, EFC6, EFC7, EFC8, EFC9	0.808	0.974
11	Environmentally Responsible Behavior (ERB	ERB1, ERB2, ERB3, ERB4, ERB5, ERB6, ERB7, ERB8, ERB9, ERB10	0.715	0.961

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5.3 Discriminant Validity

In addition, to ensure that no substantial correlation existed among the variables, discriminant validity was evaluated. Following Hair et al. (2019), the study discovered that the variables EA, EC, EFC, EK, ERB, ESN, and PA have heterotrait-monotrait (HTMT) ratios of less than 0.90. Table 4 showed no significant relationships among the variables, supporting the discriminant validity of the model.

Table 4. Discriminant validity of variables based on the HTMT ratio

	EA	EC	EFC	EK	ERB	ESN	PA
EA							
EC	0.753						
EFC	0.750	0.686					
EK	0.830	0.824	0.711				
ERB	0.835	0.703	0.779	0.815			
ESN	0.773	0.678	0.656	0.768	0.762		
PA	0.596	0.641	0.530	0.675	0.578	0.635	

Notes: EA: Environmental Attitude, EC: Environmental Concern, EFC: Environmental Facilitating Condition, EK: Environmental Knowledge, ERB: Environmentally Responsible Behavior, ESN: Environmental Subjective Norm, PA: Place Attachment.

5.4 Predictive Relevance of the Model

Next, to evaluate the quality of the inner model, we should predict the endogenous construct. The two main measures utilized to assess the inner model were the coefficient of determination (R2). The R2 value in Table 5 indicates how well the model fits the data (Hair et al., 2019). The R-Square value for the EA variable is 0.70, which means that it is explained by PA, EC, and EK by 70%, indicating a moderate category. Meanwhile, the ERB variable is explained by EA and PA by 0.77 or 77.4%, which falls into the substantial category.

Table 5. The predictive power of constructs based on R-squared

Variables	R Square	R Square Adjusted
Environmental Attitude	0.70	0.70
Environmentally Responsible Behavior	0.78	0.77

5.5 Hypothesis Testing

Out of the seven hypotheses, five were accepted, and two were rejected (see Table 6). In hypothesis 1, the path coefficient is 0.03, and the t-statistic is 0.76, which is < 1.96, with a p-value of 0.45 > 0.05. Therefore, H1 is rejected. This result indicates that tourists' PA toward zero-waste tourism destinations does not affect their EA when visiting them. In hypothesis 2, the path coefficient score is 0.21, and the t-statistic is 3.63 > 1.96, as well as a P-value of 0.00 < 0.05. Therefore, H2 is accepted. This result shows that tourists' EC influences their EA when visiting zero-waste tourism destinations.

In hypothesis 3, the path coefficient is 0.65 with a t-statistic of 11.64 > 1.96 and a P-value of 0.00 < 0.05, so H3 is accepted. It concludes that tourists' environmental knowledge (EK) influences their awareness (EA) when visiting zero-waste tourism destinations. In hypothesis 4, the path coefficient is 0.40, and the t-statistic is 6.66 > 1.96, with a p-value of 0.00 < 0.05. Thus, H4 is accepted. It indicates that EA influences

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the ERB of tourists visiting zero-waste tourism destinations. In hypothesis 5, the path coefficient score is .24 and the t-statistic is 4.22 > 1.96, with a P-value of 0.00 < 0.05. Thus, H5 is accepted. It indicates that PA affects the ERB of tourists visiting zero-waste tourism destinations.

In hypothesis 6, the path coefficient score is -0.093 with a t-statistic of 2.11 > 1.96 and a p-value of 0.04 < 0.05. Therefore, H6 is accepted. This result indicates that EFC significantly moderates the relationship between EA and ERB. In hypothesis 7, the path coefficient score is 0.06, and the t-statistic is 0.96 < 1.96 with a p-value of 0.34 > 0.05. Therefore, H6 is not accepted. This finding indicates that EFC does not moderate the relationship between PA and ERB.

Table 6. The results of the path analysis on the hypothesis effects

	Hypothesis	Path coefficients	t-statistic	p-values	Conclusion
H_1	Place Attachment→ Environmental Attitude	0.03	0.76	0.45	Rejected
H_2	Environmental Concern → Environmental Attitude	0.21	3.63	0.00	Accepted
H_3	Environmental Knowledge → Environmental Attitude	0.64	11.64	0.00	Accepted
H_4	Environmental Attitude →Environmentally Responsible Behavior	0.40	6.66	0.00	Accepted
H_5	Environmental Subjective Norm →Environmentally Responsible Behavior	0.24	4.22	0.00	Accepted
H_6	Environmental Facilitating Condition Moderates the Relationship Between Environmental Attitude and Environmentally Responsible Behavior	-0.09	2.11	0.04	Accepted
H_7	Environmental Facilitating Condition Moderates the Relationship Between Environmental Subjective Norm and Environmentally Responsible Behavior	0.06	0.97	0.34	Rejected

6. Discussion

The findings of this research suggest that EFC shapes the ERB of tourists at zero-waste tourist destinations, as discussed below.

6.1 The Effect of Place Attachment on Environmental Attitude

The first hypothesis is rejected; the test results indicated that PA does not have a significant effect on environmental attitude. This finding suggested that an individual's emotional attachment to a place does not necessarily build a positive environmental attitude. This finding indicated that tourists' attachment to zero-waste tourism destinations, whether formed through experiences related to water management, sanitation, or waste management, is not strong enough to shape their environmentally friendly attitudes. Attachment to a certain place does not necessarily imply a change in attitude, especially if the attachment is utilitarian (comfort from facilities) rather than emotional or ideological regarding environmental sustainability.

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These findings differ from those of previous studies, such as Ramkissoon et al. (2013) and Dlamini et al. (2020), which found a positive relationship between PA and environmental attitudes. This difference in results can be explained by the research context, in which Selecta Recreation Park has good environmental management facilities, so respondents' attachment may be more appreciative of the service facilities than the emotional attachment that drives ERB.

6.2 The Effect of Environmental Concern on Environmental Attitude

Environmental Concern, in the dimensions of concern for both biosphere and self, has a positive and significant effect on environmental attitude. Therefore, the second hypothesis is accepted. The higher the respondents' concern for the environment, the more positive their attitudes toward environmental protection at zero-waste tourism destinations. This finding supports the VAB framework (Homer & Kahle, 1988), that one's values and concerns form the basis for attitude formation. Environmental concern has been shown to have a positive and significant effect on environmental attitude. This finding supports the studies of Lavuri and Susandy (2020), Jaiswal and Kant (2018), which state that environmental concern is one of the main determinants in the formation of ERB.

6.3 The effect of Environmental Knowledge on Environmental Attitude

Environmental knowledge, in the dimensions of sustainable development knowledge and environmental protection knowledge, has a positive and significant effect on environmental attitude. Therefore, the third hypothesis is accepted. The higher the tourists' knowledge of environmental impacts and sustainability practices, the more positive their attitudes are towards environmental conservation in zero-waste tourism destinations. This finding supports the literature that knowledge is one of the fundamental factors in the formation of ecological attitudes (Fang et al., 2018; Ramdas et al., 2021). According to Fang et al. (2018), there is a positive relationship between environmental knowledge and environmentally friendly attitudes among students in Taiwan and China. Correspondingly, Solekah et al. (2023) identified that environmental knowledge influences the attitudes of tourists visiting Muslim-friendly destinations in Indonesia. Therefore, this study strengthens the empirical evidence that environmental knowledge is a determinant in shaping environmental attitudes in zero-waste tourism.

6.4 The effect of Environmental Attitude on Environmentally Responsible Behavior

The fourth hypothesis is also supported. This finding indicates that the more positive tourists' attitudes toward environmental conservation, the greater their tendency to exhibit responsible actions, such as sorting waste, complying with rules in tourist areas, and reporting any pollution. This is consistent with the VAB theory, that attitude is an important determinant of actual behavior (Homer & Kahle, 1988). Environmental attitude has a significant influence on ERB (Poudel & Nyaupane, 2016; Wang et al., 2018). According to Ajzen (1991), attitude is a primary predictor of intention and action. Tourists who have a positive attitude towards environmental preservation tend to be more consistent in taking concrete actions, such as not littering, supporting green transportation, and using environmentally friendly facilities. This positive attitude stems from personal values and previous experiences that shape the belief in the importance of protecting nature.

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6.5 The effect of Environmental Subjective Norm on Environmentally Responsible Behavior

The research results indicated that environmental subjective norm, has a significant effect on ERB, so the corresponding hypothesis is empirically supported. This suggests that social norms, such as pressure from friends, family, and community, encourage individuals to engage in ERB. In the context of zero-waste tourism, the norms of social groups that uphold principles of cleanliness and care for God's creation serve as a driving force for positive environmental behavior (Solekah et al., 2025). This finding is consistent with Ajzen's (1991) finding that subjective norms are a strong determinant of behavioral intentions. It reinforces the importance of building environmentally conscious tourism communities, rather than relying solely on individual messages. Destination managers can create 'Green Influencer Visitor' programs or form eco-friendly tourism volunteer communities, so tourists feel there is a social expectation encouraging them to behave responsibly towards the environment.

6.6 Environmental Facilitating Condition as a Moderator between Environmental Subjective Norm and Responsible Environmental Behavior

The environmental facilitating condition was proven to moderate the effect of environmental attitude on ERB, so this hypothesis is accepted. This means that the more positive a person's attitude towards the environment (EA), the greater their tendency to engage in responsible environmental behavior, provided that the surrounding conditions are supportive. Such conditions may include the availability of recycling facilities, information on environmentally friendly behavior, or supportive policies at tourist destinations. This significant moderation is consistent with the concept of situational constraint, which suggests that even if someone already holds strong environmental attitudes, actual behavior will manifest only when adequate external support is available. The data show that respondents with higher expenditure levels are more responsive to available facilities; they become more aware and motivated to behave in environmentally responsible ways when the supporting infrastructure is easily accessible and well communicated. This study demonstrates consistency and new contributions to behavioral science literature, particularly regarding the relationship between EA, EFC, and ERB.

Kaiser et al. (2010) stated that a positive attitude toward the environment does predict behavior, but its realization is highly dependent on the presence of external support or facilitating conditions. This research strengthens previous findings: EFC is shown to enhance the influence of EA on ERB. In other words, although individuals may have very positive environmental attitudes, ERB will not optimally manifest without the availability of supportive facilities, such as segregated waste bins or relevant information at zero-waste tourism sites. It aligns with the findings of Ho and Tan (2021) and Liu et al. (2021)who suggest external environmental factors in the actualization of pro-environmental behavior.

6.7 Environmental Facilitating Condition as a Moderator between Environmental Subjective Norm and Environmentally Responsible Behavior

The influence of environmental subjective norm on ERB through EFC is not significant, so this hypothesis is not supported. This means that EFC does not meaningfully moderate the relationship between subjective norms and ERB in the context of zero-waste tourism. This failure can be related to the frequency of visits, many respondents are first-time visitors who have not been sufficiently exposed to the destination's norms or facilities, so the norms are not strong enough to guide behavior, even when supported by the

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facilities. This finding does not support that of Wang et al. (2023), who identified the moderating role of facility conditions on the relationship between subjective norms and ERB in the context of tourists segmented by gender. On the contrary, this result reinforces the study by Go et al. (2020), that although social norms can encourage environmental behavior, the role of facilitation conditions is not strong enough as a mediator in this relationship, because norms are more about the internalization of social values than being influenced by the ease of facilities.

6.8 Managerial Implication

This study provides practical recommendations for stakeholders in zero-waste tourism management. First, environmental concern and environmental knowledge showed a significant positive effect on environmental attitude; thus, destination managers and government agencies should intensify environmental awareness programs and educational campaigns through storytelling, interactive signage, and collaborations with environmental communities. Second, environmental attitude and environmental subjective norms significantly influence ERB. Therefore, businesses should not only promote pro-environmental values through media but also foster community group activities and peer-based environmental initiatives to strengthen social norms.

Third, EFC significantly moderates the impact of environmental attitude on ERB. It substantiates that providing visible and accessible supporting facilities (such as waste sorting bins, eco-friendly sanitation, and clear information) at tourism sites could convert positive attitudes into real pro-environmental actions. Thus, tourism managers should prioritize the development and maintenance of physical infrastructure and nudge architecture, while policymakers may consider incentives and certification programs for destinations promoting best zero-waste practices. Conversely, because EFC did not significantly moderate the relationship between subjective norms and pro-environmental behavior, managers should note that the influence of social norms cannot rely solely on facility availability; it must be reinforced by ongoing education and engagement strategies. These insights guide effective strategies for advancing sustainable tourism, integrating attitude formation, norm reinforcement, and supporting the environment.

6.9 Theoretical Contribution

This research contributes to behavioral science by integrating the VAB theory with EFC as a moderating variable in the context of zero-waste tourism. First, it identifies environmental concern and environmental knowledge as significant predictors of ERB among tourists. Second, it challenges the presumed influence of PA by demonstrating a non-significant effect on environmental attitude in zero-waste destinations. Therefore, refining the understanding of emotional bonds is recommended for shaping environmental attitudes. Third, the study reveals that contextual support resources enhance the translation of attitude into action. These findings inspire the mechanisms underlying pro-environmental behavior, emphasizing the conditional role of situational factors in behavioral models and offering practical implications for designing effective environmental interventions in tourism and beyond.

This study adopts a context-sensitive behavioral standpoint, which views ERB in tourism not as a direct outcome of individual attitudes alone, but as a conditional process shaped by the interaction between internal psychological orientations and external facilitating environments. Grounded in the VAB framework, this research positions attitudes as necessary but insufficient drivers of behavior, particularly in sustainability-intensive contexts such as zero-waste tourism destinations. From this standpoint, facilitating conditions are not treated as peripheral contextual factors, but as theoretical boundary mechanisms that determine whether pro-environmental values and attitudes can be

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enacted in practice. With this perspective, the study moves beyond universalistic behavioral assumptions and advances a contextualized understanding of ERB that is sensitive to destination-specific infrastructure and management systems.

6.10 Limitations

The limitation of this study is that the research was conducted at a single zero-waste tourism destination, Selecta Recreation Park, which already provides well-developed environmental management facilities. As a result, the findings, especially regarding PA not significantly affecting environmental attitude, may be context-specific and not generalizable to destinations with less developed facilities or different visitor profiles. Besides, many respondents are first-time visitors, which likely influences the non-significant moderation effect of the environmental facilitating condition on the relationship between the environmental subjective norm and ERB. Limited exposure to the destination's norms and facilities may hinder the internalization of social norms, reducing their impact on behavior.

7. Conclusions

This study demonstrated that EFC could significantly shape tourists' ERB at zero-waste tourism destinations. Also, environmental concern and knowledge build positive attitudes toward environmental conservation, yet emotional place attachment does not influence environmental attitudes. These attitudes, together with supportive social norms, encourage responsible behavior, particularly when appropriate facilities are available to enable action. The results suggested the importance of combining positive environmental attitudes with practical infrastructure to translate intentions into sustainable behaviors. Therefore, destination managers and policymakers should invest in enhancing environmental awareness and providing adequate facilities to foster environmentally responsible tourists.

8. Recommendation

Future research could employ longitudinal designs to capture changes that occur following repeated visits. Also, this study relies on self-reported data, which may be subject to social desirability bias, especially given the environmental focus. This could lead to over-reporting of positive attitudes and responsible behaviors. Finally, although this study examines environmental concern and knowledge, other psychological or contextual factors that may influence tourists' ERB, such as personal values beyond concern, cultural differences, or economic incentives, are not included. Therefore, this study suggests their inclusion to comprehensively understand responsible environmental behavior in tourism settings. Comparative studies across diverse destination types and tourist populations would also enhance generalizability.

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