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Environmental attitudes, subjective norms, and **perceived behavioural control** in **responsible tourism practices**: A case of residents in **Redang Island, Malaysia**

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Abstract | This study explores the relationship between the Theory of Planned Behaviour (TPB) components and responsible tourism practices, incorporating perceived benefits as mediators and environmental regulations as moderators. Utilising 237 responses collected via face-to-face surveys, the study employed Partial Least Squares-Structural Equation Modeling (PLS-SEM) for hypothesis testing. The study finds that environmental attitudes do not significantly impact perceived benefits, challenging prior assumptions. Subjective norms and perceived behavioural control positively influence environmentally responsible behavioural intentions and responsible tourism practices. Surprisingly, perceived benefit is not a significant mediator, while environmentally responsible behavioural intentions mediate key relationships, and environmental regulations significantly moderate the impact of environmentally responsible behavioural intentions on responsible tourism practices. The findings also highlight the need

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for tourism policymakers and stakeholders to enhance awareness and foster environmentally responsible behaviour to align with Sustainable Development Goals (SDGs). This study innovatively challenges the traditional TPB by questioning the direct impact of environmental attitudes on perceived benefits in responsible tourism settings. It introduces environmental regulations as a key moderating factor and highlights the critical mediating role of environmentally responsible behavioural intentions in translating attitudes into sustainable actions.

Keywords | responsible tourism practices, Theory of Planned Behaviour (TPB), perceived benefits, environmental regulations, local residents

1. Introduction

Tourism continues to rank among the world's fastest-growing industries. Still, its rapid expansion is placing increasing pressure on natural ecosystems, especially in fragile environments like marine parks and small islands. While the industry is lauded for its potential to drive sustainable development, it also contributes significantly to environmental degradation through pollution, land development, and unsustainable resource consumption (Hamid et al., 2024; Kement et al., 2024). Marine parks and small island destinations, celebrated for their biodiversity and pristine landscapes, are particularly vulnerable. Overcrowding, waste generation, and habitat disruption threaten the long-term ecological viability of these areas, making sustainability no longer a peripheral concern but a pressing necessity. Without urgent efforts to mitigate irresponsible tourism behaviours, these ecosystems risk irreversible damage that would affect not only environmental health but also the livelihoods and experiences of future tourists.

In response to this crisis, global initiatives such as the United Nations' Sustainable Development Goals (SDGs) — particularly SDG 12 on responsible consumption—call for transformative changes in how tourism is practiced and managed. The tourism sector's alignment with these goals, however, remains inconsistent. Despite growing advocacy for environmental stewardship, many destinations still fail to integrate sustainable tourism practices into daily operations and stakeholder behaviours (Boluk & Rasoolimanesh, 2022; Qiu

et al., 2022). Although past studies have explored various aspects of responsible tourism (Darson et al., 2014; Hanafiah et al., 2014), much of this research has focused on tourists or general perceptions of sustainability, with limited emphasis on how local residents in small island settings adopt and internalise responsible tourism practices (RTP). Furthermore, much of the literature predating the COVID-19 pandemic may not fully reflect the evolving nature of environmental awareness and behavioural expectations in the post-pandemic tourism landscape.

This study addresses these gaps by advancing a more comprehensive and context-specific understanding of responsible tourism practices from the perspective of local residents in a marine island destination—Redang Island, Malaysia. Using an extended Theory of Planned Behaviour (TPB) framework, this study examines how environmental attitudes, subjective norms, perceived behavioural control, and perceived benefits influence environmentally responsible behaviour intentions (ERBI), and how these intentions translate into actual responsible tourism practices. Importantly, the study incorporates perceived benefits as a mediator and environmental regulations as a moderator, enhancing the explanatory power of the TPB in sustainable tourism contexts. Focusing specifically on residents, this study captures grounded, community-level insights critical for designing effective, localised policy interventions.

The novelty of this research lies in three key contributions. First, it extends the TPB by empirically validating perceived benefits and environmental regulations as integral components in shaping responsible tourism behaviours. Second, it offers a focused examination of marine park tourism through a community lens, a relatively underexplored yet critically important perspective. Third, the study provides practical recommendations for tourism planners and policymakers to enhance sustainability through resident empowerment and governance reforms.

The remainder of this paper is organised as follows: section two reviews the relevant literature and theoretical foundations, leading to the research framework and hypotheses, section three presents the methodology, including the sampling strategy and instrument development. Section four reports the results and model testing and section five discusses the theoretical contributions, practical implications, and limitations, followed by concluding remarks in section six.

2. Literature Review

The TPB has emerged as a widely used framework for understanding behavioural intentions and actual behaviours, particularly in sustainability-oriented tourism research. Besides TPB, scholars have developed several other theories to explain individuals' pro-environmental behaviours. Key among these are the Norm Activation Theory (NAT) (Schwartz, 1977), which examines the psychological drivers of pro-social and pro-environmental actions (Oh & Ki, 2023); Social Exchange Theory (SET) (Homans, 1958), which interprets human behaviour through cost-benefit analysis in social interactions (Ahmad et al., 2023); and the New Environmental Paradigm (NEP; Dunlap & Heffernan, 1975), which links environmental attitudes to sustainable behaviours (Matsiori, 2020). While these theories have significantly advanced the study of pro-environmental decision-making, TPB remains one of the most robust and widely applied models for behavioural prediction. Given TPB's empirical reliability and explanatory power, this study adopts TPB as its primary theoretical foundation.

According to Ajzen (1991), TPB posits that behavioural intention is influenced by three core constructs: attitude toward the behaviour, subjective norms, and perceived behavioural control (PBC). Attitudes refer to the individual's evaluation of the behaviour as favourable or unfavourable; subjective norms capture the perceived social pressures to perform or not perform the behaviour; and PBC denotes the perceived ease or difficulty of performing the behaviour, reflecting past experiences and anticipated challenges. In the context of sustainable tourism, these constructs have been instrumental in predicting tourists' and residents' environmentally responsible behaviour intentions (ERBI). For example, Wang et al. (2019) and Chen et al. (2021) demonstrate that positive environmental attitudes significantly influence tourists' willingness to engage in responsible tourism practices. Similarly, subjective norms—stemming from social, cultural, or institutional influences—play a key role in shaping pro-environmental behaviour, while PBC has been shown to increase both intention and actual participation in sustainable actions (Pronello & Gaborieau, 2018; Wang et al., 2019).

Several studies extend TPB by incorporating contextual and affective elements, enhancing its relevance to the complex realities of tourism behaviour. For instance, affective and instrumental beliefs regarding sustainable actions' costs, benefits, and emotional satisfaction have been shown to moderate behavioural intentions (Pronello & Gaborieau, 2018). Furthermore, the inclusion of perceived benefits (PB) of sustainable tourism (Ponnapureddy et al., 2020; Moyle

& Weiler, 2017) adds explanatory power, illustrating that individuals who recognise ecological and socio-economic benefits are more likely to adopt responsible tourism practices.

Nevertheless, TPB is not without limitations. Scholars have criticised the model for its rigid structure and limited capacity to account for the situational dynamics and spontaneous behaviours often observed in tourism settings, particularly during crises such as the COVID-19 pandemic (Pahrudin et al., 2021). Traditional predictors like norms and attitudes may be overshadowed by factors like perceived health risks or policy changes during such times. However, TPB's adaptability has allowed researchers to incorporate supplementary variables such as experiential value, environmental moral obligation, and environmental knowledge (Zhang & Chan, 2021), thereby enhancing its utility in dynamic and uncertain contexts.

In light of these considerations, this study maintains that TPB remains a foundational framework for investigating ERBI in tourism. Importantly, this research integrates TPB with constructs central to sustainability discourse—namely, environmental attitudes and responsible tourism practices (RTP). RTP reflects behaviours that minimise environmental harm, respect local cultures, and contribute to socio-economic development (Darson et al., 2014; Hanafiah et al., 2014; Lee et al., 2017). These practices align with broader sustainability goals and are influenced by both individual-level cognitions and systemic-level interventions such as environmental regulations (Haibo et al., 2020).

Environmental regulations (ER) are especially pertinent in advancing RTP. While government guidelines and policy interventions are crucial, the prevailing neoliberal governance model often prioritises economic imperatives over environmental safeguards (Lopes et al., 2021). This tension underscores the need for inclusive and participatory governance mechanisms. Sørensen and Bærenholdt (2020) argue that effective policy-making must incorporate inputs from diverse stakeholders—local residents, civil society, tourism operators, and policymakers—to ensure legitimacy, transparency, and contextual appropriateness. Consequently, this study advocates for a TPB-based approach enriched by constructs such as perceived benefits, environmental attitudes, and RTP, alongside contextual factors like ER. This integrated framework enhances understanding of the psychosocial and structural determinants of ERBI, offering valuable implications for designing interventions and policies that promote sustainable tourism behaviours.

3. Research Hypotheses

Recent developments have highlighted the importance of PB—individual beliefs about the effectiveness and advantages of engaging in sustainable behaviours—as a key antecedent to environmentally responsible behaviours. According to TPB, behavioural beliefs inform attitudes by shaping perceptions of likely outcomes (Ajzen, 1991). Scholars have expanded this relationship, demonstrating that PB influences environmental attitudes (EA) and behavioural intentions in sustainable tourism (Jiang & Kim, 2015; Liao et al., 2020). In this regard, PB reflects a belief-based construct that captures the perceived utility of pro-environmental actions, strengthening the TPB model's attitudinal and intentional components (Ponnapureddy et al., 2020).

From a sociological perspective, the social construction of reality (Berger & Luckmann, 2016) further affirms that individuals' interpretations of sustainability are shaped through subjective experiences and social interactions. Lopes et al. (2025) argue that such interpretations are continually adapted based on environmental cues and collective discourse. Thus, PB emerges as both a cognitive and socially constructed construct that mediates the formation of environmental attitudes and the translation of social norms into personal motivations. Empirical studies support the influence of PB on key TPB elements. For instance, Loureiro et al. (2022) emphasise that perceived sustainability attributes are essential in enhancing tourists' favourable evaluations of environmental behaviours. Similarly, Wang et al. (2023) suggest that subjective norms (SN) may indirectly shape PB by reinforcing the social desirability of sustainable behaviours. Arıca et al. (2023) further argue that PB directly predicts pro-environmental intentions. Figure 1 shows the research framework in a diagram. Hence, the following hypotheses are proposed:

H_1: *Environmental attitudes positively influence perceived benefits.*

H_2: *Subjective norms positively influence perceived benefits.*

Attitudes remain a central predictor in TPB and have demonstrated strong associations with environmental intentions across tourism contexts. As Ajzen (1991, 2020) contends, attitudes formed by beliefs about the outcomes of behaviour drive individuals' motivation to act. Empirical evidence confirms that positive environmental attitudes predict intentions to adopt responsible behaviours, whereas unfavourable attitudes deter sustainable action (Manosuthi et

al., 2020; Wong et al., 2021). However, Bhuiyan and Darda (2023) highlight that attitudinal influence may vary depending on context and individual values, indicating the need for complementary variables such as PB and EA. Subjective norms, another TPB component, capture perceived social pressure to engage in particular behaviours. Tourists' decisions are often influenced by the expectations of family, peers, or community leaders (Meng et al., 2020; Moon, 2021). When sustainable practices are endorsed by social groups, individuals are more likely to internalise these values, leading to stronger environmentally responsible behaviour intentions (Wang et al., 2020; Wong et al., 2021). Based on this literature, the following hypotheses are proposed:

H_3: *Environmental attitudes positively influence environmentally responsible behaviour intention.*

H_4: *Subjective norms positively influence environmentally responsible behaviour intention.*

Perceived Behavioural Control (PBC), the third fundamental component of the TPB, refers to an individual's perception of the ease or difficulty of performing a specific behaviour (Ajzen, 1991). This construct is influenced by one key dimension: control beliefs (Manosuthi et al., 2020). In the context of sustainable tourism, PBC plays a critical role in shaping tourists' and stakeholders' environmentally responsible behaviour. Numerous studies have established that individuals with high PBC—who believe they possess the resources, knowledge, and opportunities to act sustainably—tend to show stronger behavioural intentions and, importantly, are more likely to follow through with actual sustainable actions (Han & Hyun, 2017; Su et al., 2018). For example, tourists who feel confident navigating eco-friendly transport options or selecting green accommodations are more likely to integrate such choices into their travel behaviours. Moreover, PBC does not merely influence intention; it can directly shape behaviour, particularly in contexts where external facilitators (e.g., supportive infrastructure, informational cues, policy incentives) align with internal confidence. Stakeholders such as local authorities, business operators, and community members who perceive higher degrees of behavioural control—either through institutional support or personal capability—are more inclined to engage in and advocate for sustainable tourism practices (Lee et al., 2017; Fenitra et al., 2021). Thus, this study posits:

H_5: *Perceived behavioural control positively influences environmentally responsible behaviour intention.*

H_6: *Perceived benefits positively influence environmentally responsible behaviour intention.*

Building on the Theory of Planned Behaviour's foundational premise that behavioural intentions are key predictors of actual behaviour, ERBI is positioned as a direct and influential antecedent to RTP. RTP encompasses a range of sustainable tourism behaviours that aim to reduce environmental harm while enhancing the social, cultural, and ecological integrity of destinations (Darson et al., 2014; Hanafiah et al., 2014; Lee et al., 2017). These behaviours include actions such as minimising waste, respecting local traditions, conserving biodiversity, and supporting local economies. Moreover, PBC significantly enhances one's capacity to act responsibly in tourism contexts. It reflects the perceived ease or difficulty of engaging in responsible behaviours and is shaped by the availability of structural, informational, and institutional support (Arıca et al., 2023). A high sense of PBC empowers individuals to translate their environmental intentions into concrete actions, especially in the presence of enabling conditions. Importantly, RTP does not arise solely from personal intentions—it is also shaped by broader systemic factors such as policy frameworks, community involvement, and stakeholder cooperation (Han & Hyun, 2017). Thus, following TPB logic and empirical support, the final hypotheses are proposed:

H_7: *Perceived behavioural control positively influences responsible tourism practices.*

H_8: *Environmentally responsible behaviour intention positively influences responsible tourism practices.*

Perceived Benefits (PB)—individuals' belief in a behaviour's rewards or positive outcomes—play a central role in shaping pro-environmental attitudes and intentions (Evensen & Stedman, 2018). Within TPB, PB reinforces the attitudinal component by emphasising the value and effectiveness of environmentally responsible actions. Research suggests that when individuals perceive meaningful environmental, social, or economic outcomes from sustainable tourism practices, their motivation to act increases (Nian et al., 2022; Ponnapureddy et al., 2020). However, literature examining the mediating role of PB in tourism remains limited. Wehrli et al. (2017) propose that social norms and environmental attitudes may shape PB, affecting behavioural intentions. This implies that PB can serve as a cognitive bridge, transmitting the

effects of both internal beliefs (attitudes) and external pressures (subjective norms) onto behavioural intentions. As such, the following hypotheses are formulated:

H_9: *Perceived benefits mediate the relationship between environmental attitude and environmentally responsible behaviour intention.*

H_{10}: *Perceived benefits mediate the relationship between subjective norms and environmentally responsible behaviour intention.*

The TPB emphasises that intentions are the immediate antecedents of behaviour (Ajzen, 1991; Ajzen & Fishbein, 1980). In sustainable tourism, ERBI is a critical mediating mechanism that translates antecedent variables—such as environmental attitudes, social norms, perceived control, and perceived benefits—into actual RTP. Empirical studies affirm the significance of this mediating path. Chan et al. (2021) and Erul and Woosnam (2022) found that individuals with strong environmental attitudes tend to form higher ERBI, which then materialises as responsible behaviours. Similarly, Chen et al. (2021) and Wang et al. (2019) reported that societal expectations significantly enhance ERBI, ultimately encouraging RTP. The role of PBC is also evident, as individuals with greater perceived control are more confident in executing responsible behaviours (Lee et al., 2017; Sánchez-Cañizares et al., 2021). Finally, PB has been shown to enhance ERBI, providing a motivational push toward adopting RTP (Arıca et al., 2023; Jiang et al., 2023). Based on this literature, the following hypotheses are posited:

H_{11}: *Environmentally responsible behaviour intention mediates the relationship between environmental attitude and responsible tourism practices.*

H_{12}: *Environmentally responsible behaviour intention mediates the relationship between subjective norms and responsible tourism practices.*

H_{13}: *Environmentally responsible behaviour intention mediates the relationship between perceived behavioural control and responsible tourism practices.*

H_{14}: *Environmentally responsible behaviour intention mediates the relationship between perceived benefits and responsible tourism practices.*

Beyond individual cognition, structural factors, such as ER, significantly influence the effectiveness of behavioural intentions in shaping responsible actions. Regulations—ranging from waste management policies to zoning laws—create formal constraints and incentives that can either facilitate or hinder the adoption of RTP (Chan et al., 2021). When ER are stringent and enforced, they create a supportive policy environment that strengthens the link between ERBI and actual behaviours. Conversely, weak or inconsistently enforced regulations can dilute the effect of personal intentions (Wang et al., 2019). A recent qualitative study by Hamid et al. (2024) further emphasised that perceptions of regulation vary across tourism subsectors (e.g., accommodation vs. transport), suggesting that contextual alignment and stakeholder engagement are essential for regulation to impact behaviour positively. This leads to the following moderation hypothesis:

H_{15}: Environmental regulations moderate the relationship between environmentally responsible behaviour intention and responsible tourism practices.

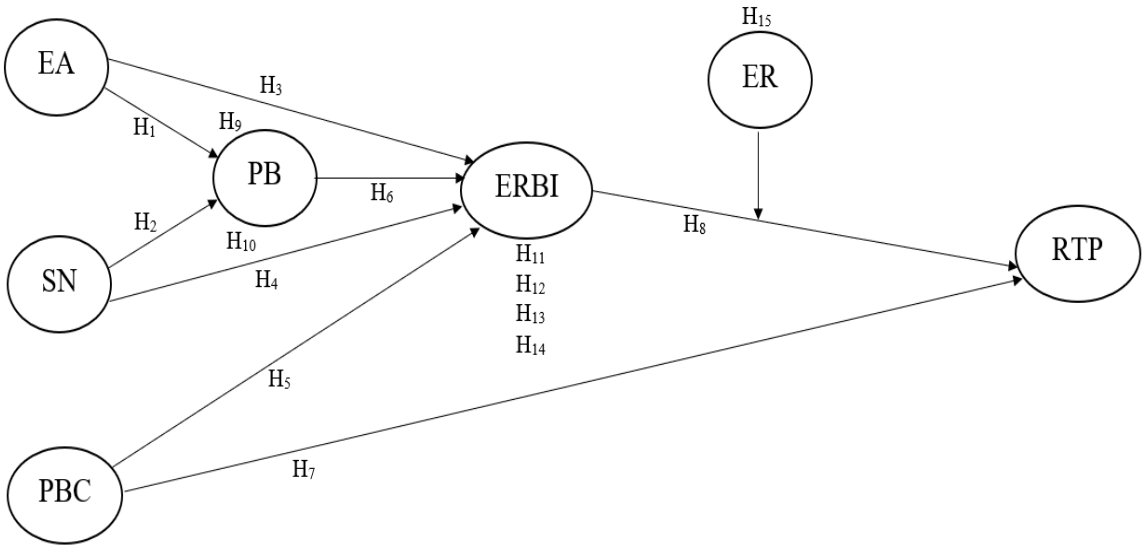


Figure 1. Research framework

Source: Authors' Elaboration

Notes: EA = environmental attitudes; SN = subjective norms; PBC = perceived behavioural control; PB = perceived benefits; ERBI = environmentally responsible behaviour intention; ER = environmental regulations; RTP = responsible tourism practices.

4. Study Methodology

Redang Island, renowned for its pristine marine ecosystem, crystal-clear waters, and vibrant coral reefs, is one of Malaysia's most prominent island tourism destinations. It attracts both domestic and international tourists seeking a premium Nature-based travel experience (Mat & Zabidi, 2023). Redang offers recreational value and environmental education as a gazetted marine park, making it an ideal context for examining responsible tourism practices in an ecologically sensitive setting (Akmal et al., 2019). While previous studies have examined responsible tourism in other locations such as the Lower Kinabatangan wetlands (Chan et al., 2021) and the highlands of Cameron (Rasdi et al., 2023), there remains a paucity of quantitative studies focusing on island destinations. This study addresses that gap by focusing specifically on Redang Island, exploring how local residents adopt and engage with RTP.

This research centres on the perspectives of local residents, who are key stakeholders in tourism development and environmental stewardship. Their behaviours and attitudes significantly influence the sustainability of tourism destinations. While relying solely on resident perceptions introduces methodological limitations—such as representational bias and the exclusion of tourists, policymakers, or observational data—this approach offers valuable, grounded insights into community-based tourism dynamics. As noted by Huber and Groß (2021), resident perspectives offer contextual depth, though they may not fully capture the complexity of tourism systems. Still, localised data are essential for developing inclusive, community-driven strategies, as supported by Jiang et al. (2023), who emphasised that positive resident perceptions are correlated with stronger support for sustainability initiatives. Hence, despite its limitations, this study places residents at the centre of its inquiry.

The study employed a cross-sectional survey approach to measure latent constructs grounded in the TPB and its relevant extensions. The survey instrument was developed using previously validated multi-item scales. EA, SN, and PBC were adapted from Wang et al. (2019), while items measuring PB were sourced from Jiang et al. (2023). ERBI was measured using Zhao et al. (2022), and ER items were based on Forsyth (1997). Finally, RTP were operationalised through items adapted from Manhas et al. (2021). All items were measured using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire was divided into three main sections. The first section assessed respondents' general awareness and knowledge of responsible tourism. The second focused on the study constructs, comprising Likert-type items to evaluate EA, SN, PBC, PB, ERBI, ER, and RTP.

The final section gathered demographic information, including age, gender, marital status, employment, income level, and years of residency on Redang Island. A brief explanation preceded each section to enhance comprehension and response quality. To establish content validity, the survey instrument was reviewed by five academic experts in tourism and sustainable development, who provided input on the clarity, relevance, and contextual suitability of each item (Su et al., 2020).

Data were collected from May to June 2023 through purposive sampling, targeting adult residents (18 years and above) who had lived or worked on Redang Island, Malaysia for at least the past two years. A power analysis using G*Power software indicated a minimum sample size of 218 was required for robust structural equation modeling. To ensure quality responses, participants were screened for eligibility and informed about the research objectives before providing oral consent. In total, 257 questionnaires were administered in person. After excluding 20 cases due to missing values and incomplete answers, 237 usable responses were retained for analysis. A pilot study with 40 residents was conducted prior to the main survey to evaluate item reliability, resulting in Cronbach's alpha values above 0.70 for all constructs and minor revisions to ensure linguistic and contextual accuracy.

The final sample consisted of 52.3% male and 47.7% female respondents. Nearly half (48.9%) were between the ages of 26 and 35, while a significant proportion (55.3%) had resided on Redang Island for over 25 years. In terms of occupation, 36.3% identified as self-employed. The sample skewed slightly toward younger adults, raising a potential concern about age-related response bias. While younger residents may be more engaged with environmental discourse, their views may not fully represent those of older or long-term residents. This demographic limitation, while not uncommon in tourism studies (e.g., with online or voluntary response surveys), underscores the need for caution in generalising the findings.

Data were cleaned, coded, and analysed using SPSS version 24 for initial descriptive statistics and demographic profiling. Partial-least Squares - Structural Equation Modeling (PLS-SEM) was conducted using SmartPLS 4.0 software to test the research model and examine hypothesised relationships among latent constructs. PLS-SEM is widely regarded for its ability to assess causal and predictive relationships in models involving complex constructs and mediation/moderation effects (Richter et al., 2016). Its robust performance in exploratory and theory-testing research within the tourism and hospitality fields further supports its appropriateness for this study (Sarstedt et al., 2020).

5. Analysis and Findings

5.1. Descriptive analysis

The descriptive analysis results in Table 1 represent the understanding of local residents on environment sustainability and responsible tourism practices at Redang Island. The island's positive surrounding environment plays a big part in leading them towards practicing responsible tourism. Descriptive analysis typically involves evaluating underlying assumptions alongside calculating the mean and standard deviation, which serve as key indicators (Pallant, 2020). This is consistent with littering activities that have been controlled further by responsible tourism practices (M = 4.20; SD = .829). They were also proud of not having many cars on the island, which shows them support eco-friendly vehicles as their main transportation was motorcycles (M = 4.04; SD = .863). In terms of perceived benefits, most of the respondents would claim that the cultural and entertainment activities on the island have been boosted (M = 4.14; SD = .835). In the context of ERBI, most of the respondents are happy to admit that they have developed a sense of obligation toward responsible tourism practices and are willing to spread awareness (M = 4.20; SD = .747). In addition, the respondents felt that the government should introduce tourism tax at tourism destinations for a win-win scenario for every stakeholder (M = 4.05; SD = .922).

Table 1. Descriptive statistics

Construct codes	Item	Mean score	Std deviation
Environmental attitude			
EA1	I believe it is wise to protect the environment of tourism site at X.	4.33	.749
EA2	I believe it is good to protect the environment of tourism site at X.	4.37	.729
EA3	I believe it is worthwhile to protect the environment of tourism site at X.	4.37	.687
EA4	I believe it is beneficial to protect the environment of tourism site at X.	4.37	.757
Subjective norms			
SN1	I believe people who matter to me think I should protect the environment of X.	4.36	.690
SN2	I believe that the people I respect hope I can protect the environment of X.	4.36	.697

Construct codes	Item	Mean score	Std deviation
SN3	I believe people I am familiar with will take part in the protection of the environment of tourism site at X.	4.28	.719
Perceived behavioural control			
PBC1	I am confident that I can do something helpful to protect the environment of X.	4.25	.710
PBC2	I believe it is up to me to do something helpful to protect the environment of X.	4.22	.725
PBC3	I believe it is easy to let me do something helpful to protect the environment of X.	4.18	.751
Perceived benefits			
PB1	The responsible tourism practice has meant X's cultural customs and ancient buildings are better protected.	4.28	.695
PB2	The responsible tourism practice has enhanced my cultural and entertainment activities at X	4.14	.835
PB3	The responsible tourism practice has improved my life and health conditions at X.	4.27	.754
PB4	The responsible tourism practice has increased my knowledge and broadened my vision of X.	4.21	.769
PB5	The responsible tourism practice has helped me make many friends and expand my social circle at X.	4.27	.782
PB6	The responsible tourism practice has increased my income at X.	4.16	.761
PB7	The responsible tourism practice has improved my living standard at X.	4.15	.828
PB8	The responsible tourism practice has increased the revenues from visitors for local government and investment at X	4.17	.753
PB9	The responsible tourism practice promoted the local economic development and improve the economic structure at X.	4.24	.767
Environmental responsible behaviour intention			
ERBI1	I will try to learn how to solve environmental problems at X.	4.15	.691
ERBI2	I will talk to others about local environmental issues at X.	4.20	.747
ERBI3	I will try to persuade my friends to protect the local environment at X.	4.23	.700
ERBI4	I will abide by the relevant regulations and not damage the local environment at X.	4.37	.649
ERBI5	I will participate if there are environmental protection activities at X.	4.23	.706
ERBI6	I will not harm the animals and plants at X.	4.44	.633

Construct codes	Item	Mean score	Std deviation
ERBI7	I will not take away sand, rock, or coral at X.	4.36	.744
ERBI8	I will interfere if I observe some bad or unethical behaviour which could harm the environment of X.	4.37	.698
ERBI9	I will stay on marked paths designated by the X authorities and not enter restricted areas.	4.35	.718
ERBI10	I will learn how to behave properly in protected areas at X.	4.43	.689
Environmental regulation			
ER1	I believe government should enforce controls on tourists and tourism development at X.	4.36	.690
ER2	I believe government should introduce tourism tax at tourism destinations.	4.05	.922
ER3	I believe environmental regulation can increase public awareness of responsible tourism in X.	4.37	.654
ER4	I believe proper guidelines should be provided for operators to use when contracting in X.	4.36	.685
ER5	I believe environmental regulation can educate tourists about diversity and sensitivity of cultures and environment at X.	4.33	.671
ER6	I believe land zonation should be introduced to allow the coexistence of enclave tourism and protected areas at X.	4.38	.656
Responsible tourism practices			
RTP1	I believe responsible tourism practice creates more employment opportunities for residents in the community of X.	4.27	.821
RTP2	I believe responsible tourism practice provides skill development and vocational training opportunities for local residents of X.	4.20	.764
RTP3	I believe responsible tourism practice creates a new market for local products in X.	4.27	.784
RTP4	I believe responsible tourism practice prefers the local candidates in recruitment.	4.19	.789
RTP5	I believe responsible tourism practice gives special attention to environmental conservation and the protection of natural ecosystem in X.	4.32	.786
RTP6	I believe responsible tourism practices control littering activities by providing the concept of recycling and reusing at X.	4.20	.829
RTP7	I believe responsible tourism practice building materials in X are from green or sustainable sources.	4.06	.816

Construct codes	Item	Mean score	Std deviation
RTP8	I believe responsible tourism practice promotes eco-friendly vehicles in X.	4.04	.863
RTP9	I believe responsible tourism practice takes initiatives for social and infrastructure community development in X.	4.12	.772
RTP10	I believe responsible tourism practice engages with local communities in X.	4.24	.781
RTP11	I believe responsible tourism practice develops a sense of personal guardianship of heritage in X.	4.21	.758
RTP12	I believe responsible tourism practice has increased residents' pride in the local culture towards community through their participation in the decision making at X.	4.21	.750
RTP13	I believe responsible tourism practice helps in preservation of culture and heritage of X.	4.14	.790
RTP14	I believe responsible tourism practice builds awareness/appreciation of cultural heritage of X.	4.19	.793

Note: X = Redang Island.

Source: Authors' Elaboration

5.2. Measurement model

The measurement model was evaluated for construct reliability, convergent validity, and discriminant validity (Sarstedt et al., 2020). Initial results revealed some items with low factor loadings and Average Variance Extracted (AVE) scores below 0.5. Consequently, nine items were removed: six from perceived benefits, one from environmental regulations, and two from responsible tourism practices. As detailed in Table 2, constructs were deemed reliable if factor loadings exceeded 0.70 and Composite Reliability (CR) and Cronbach's alpha values exceeded 0.70. Convergent validity was confirmed with AVEs over 0.50 (Hanafiah et al., 2021), while discriminant validity was assessed using the heterotrait-monotrait (HTMT) ratio, with all values below 0.90 as shown in Table 3 (Ramayah et al., 2018).

Table 2. Results of Measurement Model

Construct	Items	Loading	AVE	CR	Cronbach's Alpha
Environmental Attitudes	EA1	0.912	0.844	0.940	0.938
	EA2	0.932			
	EA3	0.919			
	EA4	0.912			
Subjective Norms	SN1	0.908	0.843	0.908	0.907
	SN2	0.938			
	SN3	0.908			
Perceived Behavioural Control	PBC1	0.879	0.816	0.889	0.887
	PBC2	0.927			
	PBC3	0.903			
Perceived Benefits	PB7	0.878	0.808	0.882	0.881
	PB8	0.902			
	PB9	0.916			
Environmentally Responsible Behaviour Intention	ERBI1	0.757	0.634	0.939	0.935
	ERBI2	0.706			
	ERBI3	0.826			
	ERBI4	0.844			
	ERBI5	0.834			
	ERBI6	0.802			
	ERBI7	0.771			
	ERBI8	0.841			
	ERBI9	0.776			
	ERBI10	0.792			
Environmental Regulations	ER1	0.808	0.803	0.942	0.938
	ER3	0.906			
	ER4	0.923			
	ER5	0.926			
	ER6	0.914			
Responsible Tourism Practices	RTP3	0.775	0.638	0.954	0.948
	RTP4	0.703			
	RTP5	0.803			
	RTP6	0.708			
	RTP7	0.758			
	RTP8	0.726			
	RTP9	0.862			
	RTP10	0.782			

	RTP11	0.889			
	RTP12	0.838			
	RTP13	0.850			
	RTP14	0.862			

Source: Authors' Elaboration

Table 3. Results of Discriminant Validity Assessment

	EA	ER	ERBI	PB	PBC	RTP
Environmental Regulations (ER)	0.764					
Environmentally Responsible Behaviour Intention (ERBI)	0.738	0.822				
Perceived Benefits (PB)	0.564	0.716	0.673			
Perceived Behavioural Control (PBC)	0.679	0.821	0.806	0.883		
Responsible Tourism Practices (RTP)	0.790	0.797	0.745	0.701	0.757	
Subjective Norms (SN)	0.779	0.795	0.824	0.693	0.827	0.739

Source: Authors' Elaboration

5.3. Structural model

Structural equation modeling (SEM) was used to test the hypothesised relationships, with results from the bootstrapping technique detailed in Table 4 and Figure 2. Due to the purposive sampling method, generalisability beyond Redang Island's residents is limited. Six of the eight hypothesised direct relationships were supported. Specifically, no significant direct relationship was found between EA and PB ($\beta = 0.144$, $p > 0.05$) or between PB and ERBI ($\beta = 0.011$, $p > 0.05$), leading to the non-support of H1 and H6.

Subjective Norms accounted for 39.4% ($R^2 = 0.394$) of the variance in PB, with a strong contribution ($\beta = 51.7\%$), while EA's impact on PB was insignificant ($p = 0.196$). EA, SN, and PBC together explained 68.0% ($R^2 = 0.680$) of ERBI variance, with contributions from EA ($\beta = 23.3\%$), SN ($\beta = 33.8\%$), and PBC ($\beta = 30.6\%$). The impact of PB on ERBI was not supported ($p = 0.487$). PBC and ERBI explained 57.9% ($R^2 = 0.579$) of Responsible Tourism Practices (RTP) variance, with PBC ($\beta = 24.3\%$) having a more significant effect than ERBI ($\beta = 18.2\%$). The Q^2 values for PB (0.313), ERBI (0.405), and RTP (0.358) indicate substantial predictive

relevance (Hair et al., 2017). The effect sizes for EA on PB (f^2 = 0.016) and PB on ERBI (f^2 = 0.003) were trivial, with SN on PB showing a medium effect (f^2 = 0.213).

Table 4. Results of Path Analysis

Hypotheses	Beta (β)	*t*-value	*p*-value	f^2	R^2	Q^2	Results
H_1: EA → PB	0.144	1.294	0.196	0.016	0.394	0.313	Not supported
H_2: SN → PB	0.517	6.540	0.000	0.213			Supported
H_3: EA → ERBI	0.233	3.094	0.002	0.079	0.680	0.405	Supported
H_4: SN → ERBI	0.338	3.894	0.000	0.121			Supported
H_5: PBC → ERBI	0.306	3.327	0.001	0.081			Supported
H_6: PB → ERBI	0.053	0.696	0.487	0.003			Not supported
H_7: PBC → RTP	0.243	6.012	0.000	0.170	0.579	0.358	Supported
H_8: ERBI → RTP	0.182	5.514	0.000	0.184			Supported

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

Source: Authors' Elaboration

5.4. Mediation effect

Perceived Benefits (PB) were hypothesised to mediate the relationships between EA and SN with ERBI. Additionally, ERBI was hypothesised to mediate the effects of EA, SN, PB, and PBC on RTP. Bootstrapping, with 5,000 samples and 95% percentile confidence intervals, was used for mediation analysis, following Hair et al.'s (2017) guidelines. A *t*-value exceeding 1.645 and a *p*-value less than 0.05 indicate significance. Ramayah et al. (2018) suggest a Variance Accounted For (VAF) value above 80% indicates full mediation, 20%-80% partial mediation, and below 20% no mediation.

Results (Table 5) showed that PB did not mediate the relationship between EA and SN with ERBI (p = 0.612; p = 0.507). A significant specific indirect effect was found for EA on RTP through PB (VAF = 54.46%). Significant mediation was also observed for SN → ERBI → RTP and PBC → ERBI → RTP. However, the PB → ERBI → RTP path was insignificant (p = 0.505). Notably, ERBI was identified as the most influential mediator, with full mediation indicated by a VAF value of 86.27% for the SN → ERBI → RTP path.

Table 5. Results of Mediation Assessment

Hypotheses	Beta (β)	Standard deviation	*t*-value	*p*-value	VAF	Results
H_9: EA → PB → ERBI	0.008	0.015	0.507	0.612	11.33%	Not supported
H_{10}: SN → PB → ERBI	0.031	0.041	0.664	0.507	34.09%	Not supported
H_{11}: EA → ERBI → RTP	0.100	0.040	2.394	0.017	54.46%	Supported
H_{12}: SN → ERBI → RTP	0.140	0.046	3.051	0.002	86.27%	Supported
H_{13}: PBC → ERBI → RTP	0.126	0.040	3.141	0.002	73.01%	Supported
H_{14}: PB → ERBI → RTP	0.025	0.033	0.666	0.505	12.17%	Not supported

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

Source: Authors' Elaboration

5.5. Moderation effect

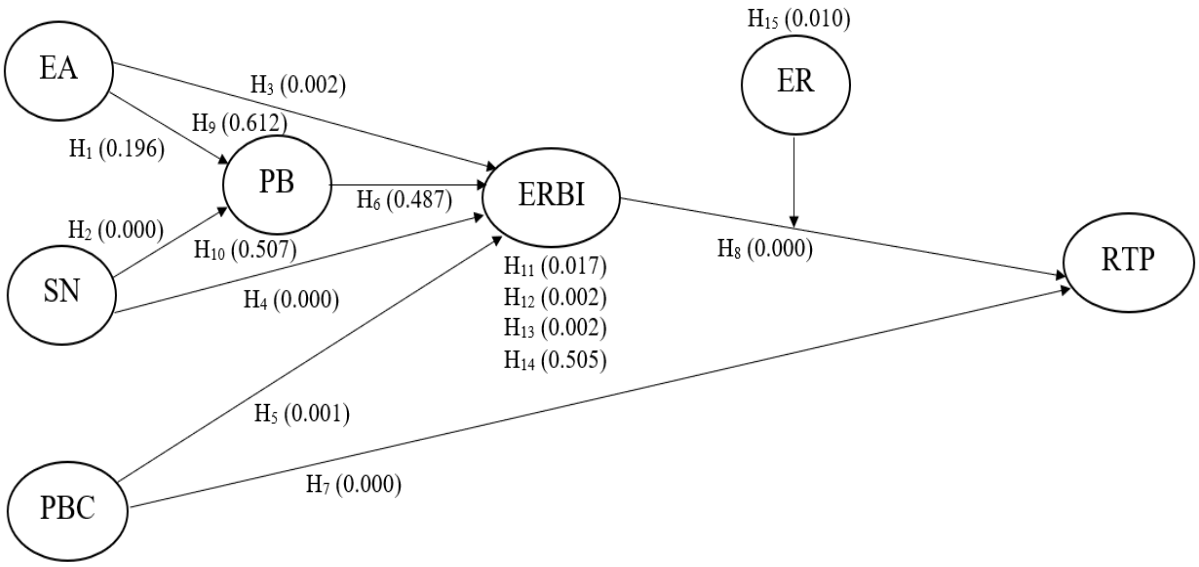
The hypothesis that ER moderate the relationship between ERBI and RTP was tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). Interaction terms between the moderator (ER) and the predictor (ERBI) were created to evaluate their effect on RTP. The initial R^2 for the main effect model was 0.579, which increased to 0.645 with ER included as a moderator, reflecting a change of 0.066 or 6.60% in explanatory power. The ER's effect size (f^2) was 0.138, indicating a small effect size, though close to medium (Cohen, 1988). Chin et al. (1996) state that even small effect sizes can be significant in certain contexts. The interaction term ER * ERBI → RTP was significant ($p = 0.010$), as shown in Table 6.

Table 6. Results of Moderation Assessment

Hypothesis	Beta (β)	Standard deviation	*t*-value	*p*-value	f^2	R^2	Results
H_{15}: ER * ERBI → RTP	-0.056	0.021	2.576	0.010	0.138	0.645	Supported

Notes: *p < 0.05, **p < 0.01, ***p < 0.001

Source: Authors' Elaboration



Notes: *p < 0.05, **p < 0.01, ***p < 0.001

Figure 2. Results of Hypothetical Model
Source: Authors' Elaboration

6. Discussion and Implications

6.1. Discussion

The study's findings provide valuable insights into the extended TPB within the context of responsible tourism. This study challenges previous studies suggesting positive EA enhances PB (Liao et al., 2020; Ponnapureddy et al., 2020). It indicates that while EA is a key component in the TPB framework, its direct impact on PB in the context of tourism may be less pronounced than previously thought. The positive influence of SN on PB was supported, aligning with literature that emphasises the role of social pressures in shaping perceptions of sustainability (Ponnapureddy et al., 2020; Loureiro et al., 2022). This finding highlights the importance of community norms in enhancing perceived benefits from sustainable practices. EA significantly impacts ERBI, consistent with TPB's assertion that attitudes shape behavioural intentions (Ajzen, 1991; Fenitra et al., 2021). This supports the theoretical linkage where positive EA led to greater intention to engage in responsible behaviours. SN also positively influences ERBI, reinforcing the idea that social expectations drive behavioural intentions (Meng et al., 2020;

Moon, 2021). This finding underscores the importance of normative beliefs in shaping intentions towards environmentally responsible behaviours.

The impact of PBC on ERBI was significant, supporting its role in the TPB framework (Ajzen, 1991; Manosuthi et al., 2020). This finding aligns with evidence that PBC facilitates the adoption of pro-environmental behaviours by influencing perceptions of control and ease (Han & Hyun, 2017). Contrary to expectations, PB did not significantly impact ERBI, suggesting that PB alone may not directly influence behavioural intentions as anticipated (Lopez-Sanchez & Pulido-Fernandez, 2016). This highlights the need to explore other mediating factors that might better explain this relationship. The positive effect of PBC on RTP was confirmed, demonstrating its practical significance in facilitating responsible tourism actions (Lee et al., 2017; Fenitra et al., 2021). ERBI positively influenced RTP, supporting the notion that intentions translate into actual responsible practices (Han & Hyun, 2017).

PB did not mediate the relationship between EA and ERBI, indicating that other variables may be more influential in this pathway (Evensen & Stedman, 2018; Nian et al., 2022). PB also did not mediate the relationship between SN and ERBI, suggesting that while SN influences PB, it may not directly impact ERBI through PB alone (Wehrli et al., 2017). On the other hand, ERBI effectively mediated the relationships between EA and RTP (54.46%), SN and RTP, and PBC and RTP, highlighting its crucial role in linking attitudes and intentions with responsible practices (Ajzen & Fishbein, 1980; Erul & Woosnam, 2022). PB also did not mediate the relationship between ERBI and RTP, suggesting that while PB impacts perceptions, it may not significantly affect RTP directly through ERBI (Arıca et al., 2023; Jiang et al., 2023). ER's moderating effect on the relationship between ERBI and RTP was significant, indicating that environmental regulations can influence how intentions translate into responsible practices, either facilitating or impeding this process (Handriana & Ambara, 2016; Chan et al., 2021).

6.2. Theoretical implications

The present study enriched the existing theoretical body of knowledge, particularly within the field of tourism research. This study innovates existing models of RTP by empirically introducing PB as a mediator and ER as a moderator within the TPB framework. The unexpected findings concerning PB in this study represent a significant theoretical implication, as they differ from established literature and offer new insights. The study also makes a significant theoretical contribution by identifying ER as a critical element in responsible

tourism studies, addressing a previously underexplored dimension in literature. ER can serve as a double-edged sword, potentially encourage or discourage RTP. By empirically examining PB's mediating role and ER's moderating effects within TPB, this research redefines the context of RTP, challenging existing paradigms and expanding tourism studies boundaries.

This study also significantly advances the literature on the TPB by providing insights into the factors influencing ERBI and RTP. Contrary to earlier research that posited a direct positive relationship between EA and PB (Liao et al., 2020; Ponnapureddy et al., 2020), this study reveals a more complex interaction. It challenges the notion that EA directly enhances PB in the tourism context, suggesting that the influence of EA on PB may be less direct than previously assumed. Instead, the study highlights that SN, which represents social pressures, is crucial in shaping perceptions of benefits. This finding aligns with literature emphasising the importance of social influences in driving sustainability perceptions (Ponnapureddy et al., 2020; Loureiro et al., 2022), thus enriching our understanding of how community norms contribute to PB from sustainable practices.

The study's results reinforce the theoretical linkage posited by TPB, particularly the role of EA in shaping ERBI. This supports the notion that positive attitudes towards the environment enhance intentions to engage in responsible behaviours, consistent with the foundational principles of TPB (Ajzen, 1991; Fenitra et al., 2021). Additionally, the positive impact of SN on ERBI underscores the significant role of normative beliefs in driving behavioural intentions (Meng et al., 2020; Moon, 2021). These findings solidify the theoretical importance of integrating normative influences into the TPB framework to understand better and predict responsible behaviour intentions.

The study also contributes to TPB literature by clarifying the role of PBC and its effects on both ERBI and RTP. The significant impact of PBC on ERBI supports its role in facilitating pro-environmental behaviours by influencing perceptions of control and ease (Ajzen, 1991; Manosuthi et al., 2020; Han & Hyun, 2017). However, PB's lack of significant mediation in the relationships between EA and ERBI and SN and ERBI suggests that PB alone may not be a strong mediator. This points to the necessity for further exploration of other mediating factors that could more effectively elucidate these relationships (Evensen & Stedman, 2018; Nian et al., 2022). The study also highlights the role of ER in moderating the relationship between ERBI and RTP, indicating that ER can significantly influence how intentions translate into actual

responsible practices (Handriana & Ambara, 2016; Chan et al., 2021). This underscores the importance of considering regulatory contexts when evaluating RTP.

6.3. Managerial implications

The findings from this study offer significant practical implications for both practitioners and policymakers involved in responsible tourism. One notable insight is the role of EA in influencing PB. Contrary to prior studies suggesting a robust relationship between EA and PB (Liao et al., 2020; Ponnapureddy et al., 2020), this study indicates that while EA remains a critical component of the TPB, its direct impact on PB in tourism may be less substantial than previously thought. Practitioners should consider that enhancing EA alone may not significantly improve PB. Instead, integrating community norms and other influencing factors may yield more effective outcomes in promoting sustainable practices.

The study further emphasises the role of SN in shaping PB, aligning with literature highlighting the influence of social pressures on sustainability perceptions (Ponnapureddy et al., 2020; Loureiro et al., 2022). This finding underscores the importance of leveraging community and social expectations to enhance the perceived value of sustainable tourism practices. For policymakers, engaging local communities and harnessing social norms can be pivotal in fostering a supportive environment for responsible tourism. Policies that align with community values and norms may facilitate greater acceptance and implementation of sustainable practices. Local residents together with other tourism stakeholders create awareness of RTP as a key policy for sustainable tourism. RTP led by residents can positively influence stakeholders' overall behaviours, fostering a culture of collective responsibility (Darson et al., 2014; Hanafiah et al., 2014; Kement et al., 2024).

Another key finding is the significant impact of PBC on ERBI, reinforcing its role in facilitating pro-environmental behaviours (Ajzen, 1991; Manosuthi et al., 2020). This supports the need for initiatives that enhance individuals' perceptions of control and ease in adopting sustainable practices, such as providing resources and removing barriers to responsible behaviour. Conversely, the study found that PB did not significantly influence ERBI, suggesting that other mediating factors should be explored to better understand this relationship (Lopez-Sanchez & Pulido-Fernandez, 2016).

Additionally, the research highlights that ERBI effectively mediates the relationships between EA, SN, and RTP, emphasising its critical role in translating attitudes and intentions into RTP (Ajzen & Fishbein, 1980; Erul & Woosnam, 2022). Practitioners should focus on strategies that strengthen ERBI to bridge the gap between intentions and actual responsible actions. The significant moderating effect of ER on the relationship between ERBI and RTP indicates that regulatory frameworks can influence how intentions are realised into practice (Handriana & Ambara, 2016; Chan et al., 2021). Policymakers should thus design and implement regulations that effectively support and reinforce responsible tourism behaviours, balancing facilitation and enforcement to achieve desired outcomes.

7. Conclusion

As global emphasis on sustainability increases, particularly through SDG 12, "Responsible Consumption and Production", this study underscores the importance of advancing responsible tourism. It finds that EA, SN, and PBC positively influence ERBI, validating the TPB as a practical framework. Although PB was not significant as a mediator, ERBI effectively mediated relationships between TPB constructs and RTP. Additionally, ER significantly moderates this relationship. This research informs stakeholders and policymakers, highlighting the need for continued efforts in promoting responsible tourism and integrating sustainable practices. Drawing on Kement et al. (2024), the following actionable measures are proposed for the governments, policymakers, and tourism stakeholders:

i. Embed environmental literacy within national tourism strategies and local governance frameworks.

ii. Curate authentic, low-impact tourism offerings that prioritise environmental and cultural preservation.

iii. Foster multi-sector partnerships between public institutions, private enterprises, and community organisations.

iv. Establish standardised sustainability benchmarks through recognised certification schemes.

v. Allocate resources toward eco-conscious infrastructure that minimises tourism's environmental footprint.

vi. Leverage digital innovations to monitor and reduce tourism-related environmental impacts.

vii. Launch targeted public outreach initiatives to highlight sustainable tourism practices.

viii. Implement incentive-based programs to cultivate enduring pro-environmental behaviours among all tourism participants.

Several studies have contributed to the literature of responsible tourism context. Fafouti et al. (2023) demonstrated that effective responsible tourism necessitates collaboration between local communities and visitors to preserve cultural heritage and natural ecosystems, thereby improving societal welfare. Their investigation of Symi, a Greek island known for religious tourism, illustrated how cultural pathways can simultaneously promote economic development and social cohesion. The island's diverse heritage assets, including archaeological monuments and natural landscapes, provided an exemplary context for formulating sustainable tourism approaches. Similarly, Chan et al. (2021) analysed responsible tourism practices in Lower Kinabatangan, Malaysia's prominent ecotourism region, finding alignment with the triple-bottom-line sustainability framework (environmental, economic, social dimensions), though with limited focus on individual behavioural factors. Both studies' findings corroborate the fundamental principles examined in the current study.

The study’s findings suggest a shift in focus towards integrating community norms, enhancing perceptions of control, and carefully crafting environmental regulations to promote RTP effectively. These insights provide valuable guidance for stakeholders aiming to advance sustainable tourism and enhance the overall impact of their initiatives. This research also opens several avenues for future inquiry. It suggests the need for further investigation into the mediating factors between EA, SN, PB, and ERBI, and how these factors interact with broader contextual variables such as environmental regulations. Future studies could explore how different types of social norms and regulatory environments impact responsible tourism behaviours across various contexts. Additionally, examining the differential effects of PB on various stages of behaviour adoption could provide deeper insights into the complex dynamics of sustainability and tourism.

This study has several limitations that point to future research directions. First, the focus on Redang Island, Malaysia, limits the generalisability of findings to other tourism destinations.

Future research should replicate this study in diverse settings, particularly in other Southeast Asian islands like Langkawi, Bali, Ko Lipe, and Boracay, which may offer different socio-demographic profiles and RTP perceptions. Second, relying on EA, SN, and PBC, the Theory of Planned Behaviour (TPB) framework may not fully capture the factors influencing behaviour (Liu et al., 2021). Future studies should explore other theories like Self-Determination Theory, Norm Activation Theory, or Expectation Confirmation Theory, which may better suit tourism behaviour studies. Third, using purposive sampling limits generalisability as only local residents were included. Expanding the sample to involve tourists, tour operators, and government agencies or adopting a multi-stakeholder approach could provide a more comprehensive understanding of RTP. Furthermore, the cross-sectional data limits the ability to infer causality, so longitudinal studies are recommended to validate the causal relationships. Lastly, respondents' long-term residence on Redang Island might have influenced their perceptions of tourism developments, which could explain the limited significance of perceived benefits. Future research should explore other constructs, such as perceived risks or costs, to gain deeper insights into RTP. These recommendations aim to improve the understanding and applicability of responsible tourism research.

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