

CONCEPTUAL MODEL OF ENVIRONMENT KNOWLEDGE, GREENWASHING FEAR, ATTITUDE AND LOYALTY IN MALAYSIA'S GREEN HOTELS

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Abstract. Environmental sustainability has become an increasingly important concern in the global tourism and hospitality industry. In response to growing environmental awareness and consumer demand for eco-friendly services, green hotels have emerged as a strategic approach to minimizing environmental impact while maintaining guest loyalty. Despite various sustainability initiatives and certification programs, the adoption of green hotels in Malaysia remains limited, particularly in terms of customer loyalty and long-term engagement. This conceptual paper aims to explore the psychological mechanisms that influence green loyalty among Malaysian hotel consumers. Specifically, it proposes a conceptual model in which environmental knowledge and fear of greenwashing serve as predictors, environmental attitude functions as the mediator, and green loyalty is the behavioral outcome. The framework is grounded in the Stimulus-Organism-Response (SOR) theory, which provides a structured understanding of how external stimuli (knowledge and trust concerns) are processed internally (attitude) to result in behavioral responses (loyalty). By integrating constructs commonly examined in isolation into a single model, this study contributes to the theoretical development of green consumer behavior in the tourism and hospitality context. It also provides practical implications for hotel managers and policymakers seeking to foster environmentally responsible consumer behavior and strengthen trust in green hotel initiatives. Future research is encouraged to empirically validate the proposed model using Partial Least Squares Structural Equation Modelling (PLS SEM).

Keywords: *environment attitude, environment knowledge, fear of greenwashing, green loyalty, green hotel*

Introduction

The hospitality and tourism industry is a key driver of economic growth and development in many countries, including Malaysia. As one of the most dynamic sectors globally, it significantly contributes to national GDP, employment, and foreign exchange earnings (WTTC, 2024). However, this industry's rapid expansion has also led to various environmental challenges, including excessive energy and water consumption, waste generation, and carbon emissions (Han, 2021). In response to rising demand for environmentally responsible services, many hospitality providers have introduced sustainable practices to reduce their ecological footprint (Fuchs et al., 2025). One prominent manifestation of this shift is the emergence of green hotel accommodations that integrate eco-friendly operations into their daily practices. Green hotels have gained popularity worldwide as consumers and regulators prioritize sustainability practices. These establishments implement energy-efficient technologies, practice water conservation, reduce waste, and use biodegradable products in their

operations (Alyahia et al., 2024). Despite such efforts, the adoption of green hotels in Malaysia remains relatively low, with only a small fraction certified under schemes such as the ASEAN Green Hotel Award (Fauzi et al., 2024). One major factor affecting the success of green hotels is consumer behaviour, particularly green loyalty, defined as long-term consumer commitment toward sustainable hospitality providers (Prayoga et al., 2024). Prior studies suggest that green loyalty is influenced by environmental awareness, perceived sincerity of green initiatives, and value alignment.

A key factor is environmental knowledge. Consumers who understand environmental issues are more inclined to support green practices (Liu et al., 2020). However, knowledge alone may not ensure loyalty, especially in the presence of greenwashing, where businesses exaggerate or falsify green claims to attract consumers (Szabo and Webster, 2021). This concern leads to fear of greenwashing, a psychological barrier that causes scepticism and distrust, ultimately undermining loyalty (Trišić et al., 2021). In the hospitality industry, where green claims are often hard to verify, this fear has become a significant challenge. To understand this behaviour better, environmental attitude is introduced as a mediating variable. Environmental attitude refers to a person's beliefs, emotions, and tendencies regarding environmental protection, which significantly influence behaviour. Even knowledgeable consumers may not act unless their attitudes are aligned with environmental values (Han, 2021). Although several studies examine knowledge, attitude, or loyalty individually, few integrate these elements into a single model with fear of greenwashing included in the model (Tokro and Dzitse, 2024). Moreover, research on Malaysian green hotel consumers remains limited, despite the country's push for sustainable tourism (Rassiah et al., 2024). This study contributes by proposing a unified conceptual model of consumer green loyalty. It not only deepens theoretical understanding but also offers actionable insights for hotel managers and policymakers aiming to enhance consumer trust and loyalty through environmental responsibility (Mohd Suki, 2016).

Furthermore, this paper adopts the Stimulus-Organism-Response (SOR) theory to conceptualize the process. The SOR model posits that external stimuli (knowledge, fear) influence internal states (attitudes), which then produce behavioral outcomes (loyalty) (Sampaio et al., 2024; Mehrabian and Russell, 1974). Thus, the main objective of this study is to determine the effects of environmental knowledge, fear of greenwashing, environmental attitude on consumers' green loyalty towards green hotels in Malaysia using the Stimulus-Organism-Response (SOR) theory.

Literature review

Environmental knowledge

Environmental knowledge refers to the awareness and understanding of environmental issues, the impact of human behaviour on nature, and sustainable actions that contribute to environmental preservation (Ardoin et al., 2015; Lee and Jan, 2015). It comprises two components: cognitive knowledge, which includes factual understanding, and experiential knowledge, gained through direct interaction with the environment. In the context of green tourism, such knowledge influences tourists' eco-friendly choices and behaviours. Nekmahmud et al. (2022) highlighted that consumers who are knowledgeable about environmental issues are more likely to engage in sustainable consumption and show loyalty to green brands. Similarly, Zheng et al. (2017) emphasized the role of environmental education in transforming knowledge into

environmentally responsible practices. Environmental knowledge also shapes environmental attitudes. De Oliveira et al. (2021) found that individuals with high environmental knowledge tend to develop positive perceptions and values that align with sustainable behaviors. According to Gelderman et al. (2021), this knowledge-attitude link is essential in fostering green loyalty. Hence, two hypotheses are proposed as follow:

H1: There is a significant relationship between Environmental Knowledge and Green Loyalty

H2: There is a significant relationship between Environmental Knowledge and Environmental Attitude

Fear of greenwashing

Fear of greenwashing refers to consumers' scepticism toward companies' environmental claims when such claims are perceived as misleading or unverified. Nekmahmud et al. (2022) described this fear as arising from false or exaggerated sustainability messaging, often driven by companies' strategic interests rather than genuine concern for the environment. In the hospitality industry, fear of greenwashing poses a significant challenge. Alyahia et al. (2024) reported that this fear undermines consumer trust and weakens their loyalty to green hotels. Han et al. (2018) added that greenwashing impairs brand credibility and discourages engagement with green programs. Consumers who suspect greenwashing tend to develop unfavourable perceptions toward environmental initiatives. Ardoin (2015) supported this, suggesting that scepticism diminishes the emotional and cognitive bond necessary for forming positive environmental attitudes. Therefore, two more hypotheses are developed as follows:

H3: There is a significant relationship between Fear of Greenwashing and Green Loyalty

H4: There is a significant relationship between Fear of Greenwashing and Environmental Attitude

Environmental attitude

Environmental attitude reflects individuals' tendencies to evaluate environmental issues favourably or unfavourably, which directly influences their behavioural intentions (Lee and Jan, 2015). This attitude is shaped by personal values, education, and environmental experiences and is crucial in promoting pro-environmental behaviour. Environmental attitude consists of three primary dimensions: cognitive beliefs, emotional involvement, and behavioural intention. According to Jan (2015), tourists with strong pro-environmental attitudes are more inclined to support green tourism initiatives. This is further affirmed by Nekmahmud et al. (2022), who argued that such attitudes drive loyalty when they align with the sustainability values of the service provider. Attitude also functions as a mediating factor. Liu (2017) and Zheng (2017) showed that attitude mediates the relationship between environmental knowledge and green loyalty. Gelderman et al. (2021) confirmed that this linkage is necessary for transforming awareness into action. Hence, three more hypotheses are developed in this study:

H5: There is a significant relationship between Environmental Attitude and Green Loyalty

H6: Environmental Attitude mediates the relationship between Environmental Knowledge and Green Loyalty

H7: Environmental Attitude mediates the relationship between Fear of Greenwashing and Green Loyalty

Green loyalty

Green loyalty refers to a consumer's commitment to continually support eco-friendly products or services due to shared environmental values (Han et al., 2018). It encompasses attitudinal and behavioural loyalty, where consumers not only repurchase but also advocate for sustainable brands (Prayoga et al., 2024; Zhang, 2023). This form of loyalty plays a critical role in sustaining business competitiveness and promoting ecological responsibility. Gelderman et al. (2021) emphasized that repeat purchase intention and positive word of mouth are strong indicators of green loyalty. Prayoga et al. (2024) added that cultivating loyalty reduces marketing costs while increasing brand trust and environmental impact. In the hospitality sector, green loyalty aligns with consumer values and enhances organizational reputation through sustained customer engagement with certified green practices. Therefore, it is crucial to sustain the highest level of loyalty among consumers since it determines the success of any business (Muhamad Nasir et al., 2022; Nasir and Wongchestha, 2022).

Proposed framework based on stimulus-Organism-Response (SOR) theory

This study proposes a conceptual framework based on the Stimulus Organism Response (SOR) theory to explain the formation of green loyalty among green hotel consumers in Malaysia (Mehrabian and Russell, 1974). The framework integrates three key predictors, namely, environmental knowledge, fear of greenwashing, and environmental attitude, to understand how psychological mechanisms influence consumer loyalty toward eco-certified accommodations (Sampaio et al., 2024). According to the SOR model, consumer behaviour is driven by external stimuli (S), which are processed internally within the organism (O), and result in a behavioural response (R). In this study, environmental knowledge and fear of greenwashing are conceptualized as stimuli; environmental attitude serves as the organism or mediator; and green loyalty is the final behavioural response (Prayoga et al., 2024; Han, 2021) (*Figure 1*).

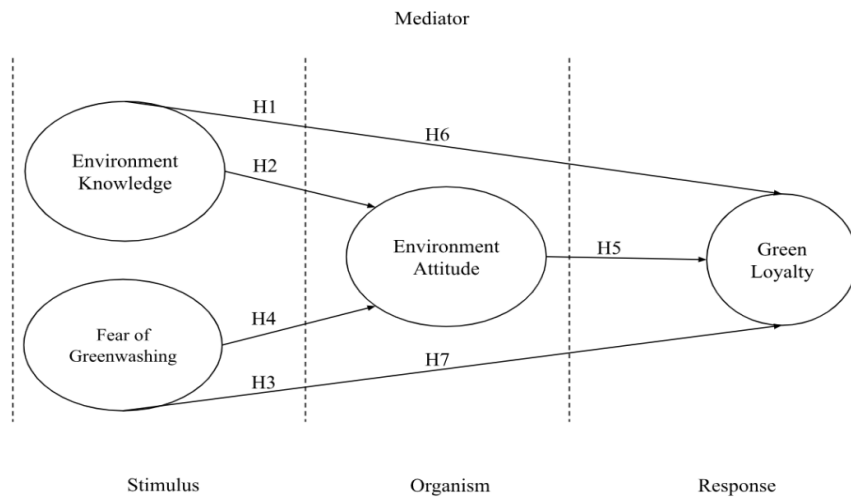


Figure 1. Proposed conceptual framework based on the Stimulus-Organism-Response (SOR) theory.

Materials and Methods

The research employs quantitative methods to examine how environmental knowledge interacts with fear of greenwashing, environmental attitude, and green loyalty among green hotel consumers in Malaysia. A single-point-in-time cross-sectional research design will be applied to collect data. The study focuses on domestic tourists who have stayed at green-certified hotels in Malaysia as its unit of analysis. The Stimulus-Organism-Response (SOR) theory supports this approach for identifying patterns while evaluating the proposed hypotheses. The research data will be collected through structured questionnaire surveys that consist of six separate sections. Screening questions in the first part will confirm that respondents satisfy the survey requirements. The second section of the survey requests information about the respondent's demographic profile, including age and gender, education level, state of residence, and hotel stay frequency. The third section of the questionnaire survey consists of environmental knowledge, fear of greenwashing, environmental attitude, and green loyalty items. Environmental knowledge items in this study are adapted from the work of Nekomahmud et al. (2022). However, the items for fear of greenwashing in this study were adapted from the study by Alyahia et al. (2024), while the items for environmental attitude were adapted from the study by Nekomahmud et al. (2022). Meanwhile, the items for green loyalty were adapted from the same source. The survey instrument employs a 7-point Likert scale to measure all items, ranging from 1 (strongly disagree) to 7 (strongly agree).

The questionnaire will undergo pre-tests with three experts who will check its clarity and content validity before the survey starts. Three experts, including a sustainable tourism academic, a statistician, and a language specialist, have been chosen to review the survey. The pilot study will consist of at least thirty participants who fulfill the study requirements. The internal consistency reliability of each construct will be tested during the pilot study using Cronbach's alpha, with values above 0.70 indicating acceptable results. This study uses purposive sampling to select participants who meet five essential criteria: participants must be 18 years or older, have stayed at AGHS or GBI

green hotels, understand environmental practices, have experience with greenwashing practices, and have stayed at the hotel for leisure, business, or personal reasons. To statistically validate the minimum required sample size, an a priori power analysis was conducted using G*Power 3.1. Assuming a medium effect size ($f^2=0.15$), an alpha level of 0.05, a statistical power of 0.80, and four predictors in the structural model, the analysis indicated a minimum sample size of 85 respondents. The *Table 1* summarize the calculation of sample size of this study.

Table 1. Summary of Ssmple size calculation using G*Power.

Parameter	Specification
Software Used	G*Power 3.1
Effect Size (f^2)	0.15 (Medium)
Alpha Level (α)	0.05
Statistical Power (1- β)	0.80
Number of Predictors	4
Minimum Sample Size	85 respondents

The data collection process will take two months to finish through both online and offline platforms. Hotel reception areas will receive both digital and printed questionnaires that guests can complete after their departure. Hotel staff will verify that respondents fulfil the study requirements before they participate. The study will employ Partial Least Squares Structural Equation Modelling (PLS-SEM) version 4 for data analysis. The analysis will start by evaluating the measurement model to check its reliability and validity, which includes indicator reliability, composite reliability, convergent, and discriminant validity. The research will evaluate the structural model to determine the power and statistical significance of all proposed relationships. The bootstrapping approach will help identify the statistical significance of both direct and indirect effects in the model.

Results and Discussion

This research study introduces a seven-hypothesis model that includes five direct and two indirect paths to investigate how environmental knowledge and fear of greenwashing impact green loyalty through environmental attitude as the mediator. The model depends on the Stimulus-Organism-Response (SOR) theory, which treats environmental knowledge and fear of greenwashing as external factors (stimuli), environmental attitude as the internal state (organism), and green loyalty as the outcome (response). This research study addresses a literature gap by uniting all four essential variables into one research framework. The study adds value by examining environmental attitude as a mediator, even though such studies remain scarce in the green hotel context of Malaysia. The study provides critical findings for hotel managers, together with marketing professionals and tourism authority personnel in Malaysia. Green hotel operators can enhance their services through understanding the influence of environmental knowledge and trust on customer loyalty. The combination of transparency alongside educational initiatives and official certification use, such as AGHS or GBI, helps reduce greenwashing concerns, which results in enhanced customer trust and loyalty. The research findings will help tourism marketers create more effective promotional strategies. Clear marketing of actual eco-friendly practices alongside their benefits enables tourism marketers to draw environmentally conscious

visitors who develop lasting connections with the industry. The research findings will help policymakers develop better green policies while enhancing the reliability and visibility of green hotel standards. The development of educational programs should be planned to teach green tourism principles to both hotel operators and tourists. This research supports Malaysia's mission to establish itself as a sustainable tourism destination. The study enables tourists to gain information and confidence, which results in increased repeat bookings, positive feedback, and long-term support for green hotels. As the present study is conceptual in nature, no empirical results are demonstrated. Instead, the proposed model integrates the environmental knowledge, fear of greenwashing, and environmental attitude to explain green loyalty among Malaysian hotel consumers. By applying Stimulus-Organism-Response (SOR) theory, the framework highlights how external factors (knowledge) influence internal states (attitude) that ultimately shape consumer loyalty. The discussion emphasizes that greater environmental knowledge and fear of greenwashing mediated by strong environmental attitudes creates loyalty among green hotels consumers. This conceptual integration advances theoretical understanding and provides a foundation for future empirical testing using PLS-SEM to validate the proposed relationships.

Conclusion

This conceptual paper investigates the comprehensive model that demonstrates how environmental knowledge and fear of greenwashing affect environmental attitudes and green loyalty among green hotel consumers in Malaysia. Based on the Stimulus-Organism-Response (SOR) theory, this study develops a theoretical model that uses environmental knowledge and fear of greenwashing as stimuli which operate through environmental attitude (organism) to produce green loyalty (response). Academic research remains scarce regarding the unified analysis of these four variables particularly within Malaysia's green hotel industry. The research fills an essential knowledge gap by incorporating environmental attitude as an intervening variable to analyze how consumer knowledge and scepticism impact their loyalty toward eco-certified lodging facilities. The proposed model investigates the loyalty-enhancing effects of positive environmental knowledge while showing how fear of greenwashing reduces loyalty unless environmentally friendly attitudes effectively intervene. This research carries dual importance for scholarly investigations. This research enhances the sustainable tourism application of SOR theory through empirical testing of environmental attitude as a mediating variable. Hotel operators, along with marketers and policymakers, can use the developed framework to create successful strategies that build trust while promoting transparency to encourage green behaviours among hotel guests. The Malaysian green hotel certification rates remain low while sustainability demands from consumers continue to grow at an increasing pace. The research will produce a validated framework that demonstrates how environmental knowledge and positive attitudes strengthen green loyalty and fear of greenwashing reduces it unless effectively managed. The following research requires Partial Least Squares Structural Equation Modelling (PLS-SEM) analysis to validate the proposed hypotheses in the research framework.

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Conflict of interest

The authors confirm that there is no conflict of interest involved with any parties in this research study.

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