

JMBI (Journal of Marketing and Business Intelligence)
JMBI, Volume 04, Number 02, November 2026
EISSN: 2987-0879; PISSN: 2987-0860, pp. 152-175
https://journal.yhmm.or.id/index.php/JMBI

STRATEGIC DRIVERS OF GREEN CUSTOMER LOYALTY: THE MEDIATING ROLE OF GREEN CUSTOMER SATISFACTION IN THE GREEN PACKAGED MINERAL WATER INDUSTRY

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Article history:
Received: June 13, 2026
Revised: October 22, 2026
Accepted: November 17, 2026

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Keywords:
Green Branding;
Green Value;
Green Customer Satisfaction;
Green Customer Loyalty;
Packaged Mineral Water;
Mediation;
PLS-SEM.

Abstract
Green marketing research has documented direct links between green branding, green value, and green loyalty, yet the mediating mechanism through which these two distinct antecedents operate, and their relative strength, remains insufficiently tested in low-involvement, plastic-intensive categories such as packaged mineral water in emerging markets. This study therefore tests a parallel dual-path mediation model in which green customer satisfaction transmits the effects of green branding and green value to green customer loyalty. A cross-sectional survey of 400 consumers of eco-friendly packaged mineral water in six major Javanese cities (Jakarta, Bandung, Surabaya, Yogyakarta, Semarang, and Tangerang) was conducted using purposive sampling, and the data were analyzed with PLS-SEM (SmartPLS 3.2.6) and bootstrapping. All seven hypotheses were supported ($p < 0.001$). Green branding had the strongest effect on green customer satisfaction ($\beta = 0.645$), and green customer satisfaction partially mediated both the green branding–loyalty relationship (indirect $\beta = 0.237$; VAF = 43.3%) and the green value–loyalty relationship (indirect $\beta = 0.084$; VAF = 23.3%). The model explained 62.4% and 69.1% of the variance in satisfaction and loyalty, respectively. Credible brand-level environmental signals therefore emerge as a stronger lever than perceived green value, with satisfaction acting as the conduit that converts both

into loyalty. The findings inform green marketing strategy, anti-greenwashing labeling policy, and future research in emerging markets.

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I. INTRODUCTION

The global shift toward environmental sustainability has fundamentally reshaped the competitive landscape of modern business. As ecological concerns intensify and regulatory frameworks tighten, firms across industries are increasingly compelled to adopt environmentally responsible strategies, not merely as ethical obligations, but as instruments of competitive differentiation. Among these strategies, green marketing has emerged as a pivotal mechanism through which firms align their value propositions with the sustainability expectations of increasingly eco-conscious consumers (Olson, 2008). At the corporate level, green strategy influences decisions across the entire organizational hierarchy, from business and operational strategies to information systems and technology infrastructure (Olson, 2008). For manufacturers, particularly those operating in developing economies such as Indonesia, the capacity to integrate green strategy with competitive positioning has become a critical determinant of long-term market survival (Riyadi & Sumardi, 2017; Tampubolon et al., 2022). This is especially salient in the packaged drinking water industry, where environmental concerns regarding plastic waste, resource depletion, and product safety are gaining significant public and regulatory attention (Ikhsani, Gumanti, et al., 2025; Ikhsani, Riyadi, et al., 2025).

The theoretical foundation for examining firm-level green strategy is grounded in several complementary frameworks. The marketing mix, originally conceptualized by Borden (1964) and refined into the 4P model by McCarthy (1960), provides the foundational scaffolding for understanding how firms design and communicate their value offerings (Assagaf, 2023). The subsequent expansion to the 7P model by Booms and Bitner (1981), incorporating *people*, *physical evidence*, and *process*, extended this framework to service-oriented contexts, acknowledging that customer-facing touchpoints and operational processes are integral to perceived value. When applied to green marketing, these dimensions collectively constitute what scholars term the "green marketing mix," encompassing green product design, green pricing, green distribution, and green promotional communication. Complementing the marketing mix perspective, the Triple Bottom Line (TBL) framework advanced by Elkington (1994, 1998) provides a normative lens through which corporate sustainability performance can be evaluated across three interdependent dimensions: profit, people, and planet. The TBL framework challenges the conventional primacy of financial performance by emphasizing that long-term organizational legitimacy and value creation are contingent upon simultaneous attention to social equity and environmental stewardship. In the context of Indonesia's packaged drinking water sector, TBL principles are increasingly reflected in regulatory requirements pertaining to product labeling, recyclability, and food-grade packaging standards.

Despite their breadth, the marketing mix and TBL perspectives are essentially firm-side frameworks: they specify what firms should offer and

communicate, but not how consumers process these offerings and convert them into loyalty. To bridge this gap, the present study complements them with three consumer-side theories that are developed in the Hypothesis Development section: signaling theory (Spence, 1973), which explains how green branding reduces information asymmetry about unverifiable environmental claims; perceived value theory (Zeithaml, 1988), which explains how consumers weigh green benefits against sacrifices; and expectation–confirmation theory (Oliver, 1980), which explains how satisfaction arises and subsequently shapes loyalty. Together, these theories provide the logic for each of the seven hypotheses tested.

Consumer decision-making in the context of green products is shaped by a complex constellation of factors, including green branding and green value. Furthermore, post-purchase behavioral intentions, including loyalty, have been shown to be significantly influenced by brand awareness, brand association, and brand loyalty constructs (Ikhsani & Hudaya, 2020), suggesting that the pathway to sustained green customer loyalty is multidimensional and brand-mediated. The role of brand trust and risk perception also warrants attention in the green consumption context. Ikhsani et al. (2021) demonstrated that perceived risk and brand trust are meaningful predictors of purchase intention, particularly in contexts characterized by uncertainty, a condition highly applicable to green product markets, where consumers frequently encounter asymmetric information regarding product credibility and environmental claims. This finding highlights the importance of building robust brand trust as a prerequisite for sustained green consumer engagement, especially in the post-pandemic consumption environment where risk sensitivity among consumers has been heightened.

The competitive dynamics of the Indonesian packaged drinking water market are further illuminated by longitudinal data drawn from the Top Brand Index, a nationally recognized brand performance benchmark that measures consumer brand preference and top-of-mind awareness across product categories. Top Brand Index data for the packaged drinking water category from 2020 to 2023 reveals a market landscape characterized by persistent dominance of a single incumbent brand alongside the gradual emergence of challenger brands (Top Brand Award, 2024). Although AQUA maintains the highest Top Brand Index score throughout the observed period, its index value has demonstrated a consistent downward trajectory, declining from 62.5% in 2021 to 55.1% in 2023, suggesting a gradual erosion of dominant brand preference that may be attributed, in part, to the rising competitive strength of challenger brands. Le Minerale, which markets itself on the basis of product purity and packaging integrity, recorded the most significant upward movement among all brands, growing from 4.6% in 2021 to 14.5% in 2023, a trend that signals increasing consumer responsiveness to product quality differentiation in this category. By contrast, brands such as Ades and Club recorded consecutive declines across the observed period, reflecting the vulnerability of brands that fail to sustain strong and differentiated market positioning.

Critically, however, none of the brands listed in the index is positioned with a green brand identity that is unambiguously anchored in consumer recognition of environmental values. This observation is consistent with the argument advanced by Fernando et al. (2017) that green branding is the most powerful determinant of green customer loyalty, and simultaneously exposes a significant strategic gap: the brands operating in this category have not yet succeeded in leveraging green branding as a primary driver of consumer preference at a scale

sufficient to be reflected in top-tier brand performance indices. The data thus provides concrete, market-level evidence for the research problem motivating the present study, namely, that the failure of green product brands to secure prominent positions in recognized brand performance benchmarks materially diminishes their market attractiveness and impedes the development of green customer loyalty (Ikhsani et al., 2025). These findings underscore the imperative for brands in the packaged drinking water industry to adopt and consistently execute effective green marketing strategies that emphasize green value and the demonstrable superiority of their green product offerings. By doing so, these brands can cultivate greater market recognition, strengthen consumer-brand relationships, and ultimately advance green customer loyalty, outcomes that are contingent not only upon the credibility of green branding, but also upon the perceived green value delivered to consumers at every point of the consumption experience (Fernando et al., 2017; Han et al., 2018).

Despite the growing body of literature on green marketing and consumer behavior, three research gaps remain. First, evidence on green loyalty is concentrated in services, retail, and personal-care or durable goods, for example hotels and cruises (Assaker et al., 2020; Han et al., 2018; Sun et al., 2022), banking (Tiwari, 2023), and supermarkets (Fernando et al., 2017). Low-involvement, high-frequency categories such as packaged mineral water, in which plastic waste is the most salient environmental issue, have rarely been examined; the authors' earlier work (Ikhsani, Gumanti, et al., 2025; Ikhsani, Riyadi, et al., 2025) is among the few exceptions. Second, most prior studies test the direct effects of green branding or green value on loyalty, or treat satisfaction as a mediator within a single-antecedent model. Few studies have estimated, within one model, the parallel indirect effects of a symbolic and communicative antecedent (green branding) and an evaluative and utilitarian antecedent (green value) through the same mediator, and then compared their direct, indirect, and total effects. Consequently, it remains unclear whether satisfaction fully or only partially transmits the effect of each antecedent, and which antecedent matters more. Third, empirical evidence from Indonesia, and from Java as its largest consumer market, is limited and fragmented, even though concerns about greenwashing make the credibility of environmental claims particularly consequential in this setting.

The novelty of this study lies in its mediation framework. Rather than treating green branding and green value as parallel direct predictors, the study specifies a parallel dual-path mediation model in which green customer satisfaction is the focal mediator linking two conceptually distinct antecedents to green customer loyalty. This specification allows (i) the direct and indirect effects of each antecedent to be separated and the type of mediation to be classified as complementary partial, competitive partial, or full (Zhao et al., 2010); (ii) the relative importance of brand-level signals and value-level evaluations to be compared on a common metric; and (iii) the mechanism to be interpreted through an integrated signaling–value–confirmation logic rather than a single theory.

Accordingly, the study makes three contributions that correspond directly to the variables investigated. First, theoretically, it integrates signaling theory, perceived value theory, and expectation–confirmation theory into a single mediation framework that explains how green brand signals and green value perceptions are converted into green customer loyalty through satisfaction. Second, empirically, it provides evidence from 400 consumers in six Javanese cities on the direct, indirect, and total effects of green branding and green value,

and on the partial nature of the mediating role of satisfaction in an emerging-market, low-involvement category. Third, practically, it identifies where packaged mineral water brands and regulators should concentrate their efforts to build credible green brands and to counter greenwashing. The study is guided by two research questions: (RQ1) Do green branding and green value affect green customer loyalty directly and indirectly through green customer satisfaction? (RQ2) Which antecedent exerts the stronger effect, and is the mediation full or partial?

II. LITERATURE REVIEW

Green

The concept of "green" refers to products, services, practices, or actions that are designed or carried out with deliberate attention to the protection and preservation of the natural environment. This encompasses efforts to reduce negative environmental impacts, safeguard natural resources, and promote the long-term sustainability of the planet (Dangelico & Vocalelli, 2017). Manongko (2018) further characterizes the green concept as encompassing practices, products, or services specifically aimed at minimizing adverse effects on the natural environment, including measures to reduce pollution, conserve energy, manage waste efficiently, and support environmental sustainability. From the perspective of Utomo et al. (2021), the green concept represents an approach that positions environmental protection as the foremost priority across all dimensions of human activity, including production, consumption, transportation, and natural resource utilization, with the overarching objective of achieving harmony between economic growth and environmental conservation. Hendra et al. (2023) similarly define the green concept as practices or products intentionally designed to reduce negative environmental impacts and advance sustainability, encompassing efforts to reduce greenhouse gas emissions, limit plastic consumption, and optimize the use of natural resources. Munandar (2023) further characterizes the green concept as a descriptor referring to actions or policies directed toward supporting the protection of the natural environment and maintaining ecological balance.

Green Customer Loyalty

Customer loyalty has been defined by Pahlevi and Suhartanto (2020) as a deeply held commitment to consistently repurchase or re-patronize a preferred product or service in the future, resulting in repeated purchases from the same brand or set of brands despite situational influences and marketing efforts that might otherwise induce switching behavior. Consistent with this view, Liu et al. (2020) conceptualize customer loyalty as the degree of consumer commitment to consistently purchasing or reusing a favored product or service in the future, while Çavusoglu et al. (2021) characterize it as the act of maintaining a relationship with a business through the continued purchase of its goods and services. Distinct from general customer loyalty, green customer loyalty is defined by Tiwari (2023) as the extent to which a consumer forms intentions and obligations to purchase products or services with explicit regard for environmental sustainability. Çavusoglu et al. (2021) further conceptualize green customer loyalty as the consumer's commitment to consistently repurchase or support a preferred product in the future, motivated by a desire to maintain a relationship with businesses that demonstrate genuine environmental responsibility. Synthesizing these perspectives, the present study defines green customer loyalty as the consumer's commitment to

choosing green products over conventional alternatives, manifested through repeated green product purchases or other positive behavioral expressions such as direct personal testimonials. The measurement dimensions of green customer loyalty adopted in this study are drawn from Gelderman et al. (2021), comprising purchase repetition, word-of-mouth intentions, and willingness to pay a premium.

Green Customer Satisfaction

Satisfaction has been broadly characterized as a reactive response to the fulfillment of expectations associated with a consumption interaction (Çavusoglu et al., 2021). Parlan et al. (2016) define satisfaction as the quality or condition of a consumer's purchasing situation in which a product successfully meets consumer needs or desires. Kusmayasari et al. (2014) conceptualize satisfaction as the consumer's evaluative judgment of the product or service attributes that have succeeded in meeting needs in a fulfilling manner, whether exceeding or aligning with prior expectations. Suhaily and Darmoyo (2019) describe satisfaction as a representation of the consumer's psychological state arising when emotional expectations associated with prior experience are fulfilled, while Karunaratna and Kumara (2018) characterize it as the consumer's perception that consumption has yielded outcomes commensurate with a standard of pleasure relative to discomfort. Savitri et al. (2016) further explain satisfaction as the level of an individual's emotional evaluation following a comparison between a product's actual performance and their prior expectations, noting that this evaluative outcome may generate either positive or negative perceptions of the product. Synthesizing these perspectives, the present study defines green customer satisfaction as the level of customer satisfaction that arises from a product's capacity to meet consumer needs and desires in an environmentally responsible and sustainable manner.

Green Branding

Brand, in its most fundamental sense, refers to the physical and behavioral characteristics of a company, including its name, products or services, ideology, and the nature of communication between service staff and consumers (Tiwari, 2023). Retnaningtyas (2019) elaborates that a brand is a complex entity that embodies an organization's commitment to its consumers, extending well beyond a mere company or product name. A brand may also be understood as a company's promise to consumers regarding what its products will deliver and how they will fulfill consumer needs. Ngo et al. (2019) argue that a brand functions as an effective medium for conveying the superiority and value that a service can provide, serving as a guarantee of quality, origin, and capability, thereby enhancing awareness and reducing the risk and complexity inherent in purchase decisions. Branding is widely regarded as one of the most critical elements in the execution of the marketing process, enabling organizations to focus on cultivating customer loyalty and reinforcing the strategic importance of brand identity (Biswas, 2022). It is defined as the process of assigning identity to products or services through the use of logos or distinctive designs that differentiate them from competing offerings (Saragih & Prayitta, 2023), and is understood as a continuous process that draws upon a company's history to construct a consistent personality for the company and its products going forward (Dermawan et al., 2020). Green branding constitutes a central component of the broader green marketing concept and has given rise to new perspectives in green marketing research and management (Danko & Nifatova,

2022). It refers to the practice whereby a company promotes its commitment to resource conservation, positioning itself as a green, sustainable, and organic brand. Through green branding, a brand can visibly demonstrate its contribution to environmental benefits, thereby cultivating a loyal consumer base (Tanwari, 2020). Synthesizing these perspectives, the present study defines green branding as a marketing strategy aimed at identifying and communicating the green characteristics of a brand's products to consumers.

Green Value

Value, in its general sense, refers to the overall consumer assessment of the net worth of a product or service based on what is received relative to what is given, that is, the outcome of a relative evaluation of the benefits and costs associated with a given offering (Paulose & Shakeel, 2022). Sarasuni and Harti (2021) characterize value as the perception held by consumers toward a product they have used, representing the outcomes or benefits obtained in relation to total costs incurred. Handi et al. (2018) explain that value is grounded in the consumer's evaluation of a product or service offering, taking into account both the benefits received and the costs expended. Mustonen et al. (2016) emphasize that value is a function of both quality and sacrifice, concluding that cost factors, including price and other forms of sacrifice, are more determinative than quality alone in shaping perceived value. Liu et al. (2020) characterize value as users' overall assessment of the utility of benefits relative to sacrifices, while Pahlevi and Suhartanto (2020) observe that value, as a product of consumer evaluation, generates word-of-mouth effects that significantly influence consumers' intentions not only to repurchase but also to recommend. In the green consumption context, green value refers to consumers' assessment of the utility or functionality of green products, based on their cognitive perceptions of what is received relative to what is sacrificed (Han et al., 2018). Green value further reflects the perceived importance of ecological sustainability and the consumer's desire to act in ways that preserve the natural environment, while simultaneously representing the perceived value of business exchange in the sense of adding value to create future strength and competitive advantage for the firm (Mustonen et al., 2016). Synthesizing these perspectives, the present study defines green value as the evaluation conducted by consumers of the benefits obtained from green products relative to what they sacrifice, assessed within the context of environmental needs and sustainability considerations.

HYPOTHESIS DEVELOPMENT AND CONCEPTUAL FRAMEWORK

Theoretical Foundation

The framework rests on three complementary theories that map onto the structural relationships in the model. Signaling theory (Spence, 1973) holds that when buyers cannot directly verify product attributes, observable seller cues convey unobservable quality. The environmental attributes of packaged water, such as recyclability, plastic content, and sourcing, are credence attributes that consumers cannot verify at purchase; green branding (names, logos, eco-labels, and consistent environmental communication) therefore operates as a signal that reduces information asymmetry and the perceived risk of greenwashing. Perceived value theory (Zeithaml, 1988) conceptualizes value as the overall evaluation of what is received relative to what is given; in green consumption, the benefits received include ecological benefits in addition to functional ones, so green value reflects a cognitive benefit–sacrifice evaluation (Han et al., 2018). Expectation–confirmation theory (Oliver, 1980) posits that satisfaction

arises when perceived performance meets or exceeds expectations, and that satisfaction in turn shapes repurchase intention and loyalty. Within this logic, green branding shapes expectations (signal), green value shapes the evaluation of performance (benefit–sacrifice), and green customer satisfaction is the confirmation outcome that sustains green customer loyalty (Chen, 2010; Gelderman et al., 2021). Based on this reasoning, seven hypotheses are proposed.

Hypotheses

Consumers rarely verify environmental claims at the point of purchase and therefore rely on brand cues to infer product quality and environmental credibility (Spence, 1973). A brand that consistently communicates its environmental commitment through its name, symbols, labels, and packaging signals that the offering is likely to fulfill consumers' environmental and functional expectations, which raises the likelihood that these expectations are confirmed after consumption (Oliver, 1980; Chen, 2010). Studies in banking, cosmetics, coffee-shop, and eco-product contexts report that green branding, green brand image, and green marketing positively influence satisfaction (Tiwari, 2023; Nguyen-Viet, 2022; Ikramayosi et al., 2022; Savitri & Marlena, 2023; Steven & Pratiwi, 2020; Dipa & Pratama, 2017). Hence:

H1: Green branding has a significant positive effect on green customer satisfaction.

Perceived value theory suggests that satisfaction increases when the benefits obtained from an offering outweigh the sacrifices made to obtain it (Zeithaml, 1988). For green products, benefits include environmental contributions in addition to product performance, whereas sacrifices include price premiums and effort (Han et al., 2018; Mustonen et al., 2016). When consumers judge that a green product offers favorable net value, their experience is more likely to confirm or exceed expectations, producing satisfaction. A positive association between value and satisfaction has been reported in hospitality, shared-mobility, and eco-product settings (Liu et al., 2020; Pahlevi & Suhartanto, 2020; Han et al., 2018; Paulose & Shakeel, 2022; Issock et al., 2020). Hence:

H2: Green value has a significant positive effect on green customer satisfaction.

Signals of environmental commitment also have lasting relational consequences. By communicating a stable environmental identity, green branding builds trust and identification that strengthen consumers' commitment to repurchase and recommend the brand, independent of any single consumption episode (Fernando et al., 2017; Tanwari, 2020). Evidence from agri-food, banking, and digital-payment contexts shows that branding is positively associated with customer loyalty and willingness to pay a premium (Danko & Nifatova, 2022; Saragih & Prayitta, 2023; Biswas, 2022). Hence:

H3: Green branding has a significant positive effect on green customer loyalty.

Customers who regard a green product as delivering benefits that justify its costs have less reason to switch to alternatives and are more inclined to repurchase and to recommend it (Pahlevi & Suhartanto, 2020; Mustonen et al., 2016). Studies of loyalty in retail, hospitality, shared-mobility, and industrial settings support a positive direct relationship between perceived (green) value and loyalty (Liu et al., 2020; Dabija & Bejan, 2019; Karunaratna & Kumara, 2018; Paulose & Shakeel, 2022). Hence:

H4: Green value has a significant positive effect on green customer loyalty.

Expectation–confirmation theory identifies satisfaction as the central antecedent of post-purchase intentions: consumers whose expectations are confirmed develop favorable attitudes and are more likely to repurchase (Oliver, 1980). In green consumption, satisfied consumers are expected to maintain relationships with brands that they perceive as environmentally responsible (Çavusoglu et al., 2021; Gelderman et al., 2021). A positive association between green satisfaction and green loyalty has been reported in hotel, banking, and business-to-business settings (Assaker et al., 2020; Sun et al., 2022; Tiwari, 2023; Pahlevi & Suhartanto, 2020; Nguyen-Viet, 2022). Hence:

H5: Green customer satisfaction has a significant positive effect on green customer loyalty.

Integrating the preceding arguments, satisfaction is expected to be the mechanism through which both antecedents influence loyalty. Green branding raises expectations and credibility; when consumption confirms them, satisfaction arises and reinforces loyalty, implying an indirect path from green branding to loyalty (Tiwari, 2023; Damayanti & Wahyono, 2015; Awal et al., 2018; Tyas, 2020). Likewise, favorable perceived green value must be experienced as a satisfying outcome before it consolidates repurchase and advocacy (Han et al., 2018; Al Amin & Dhewi, 2021; Wahyuni & Ihsanuddin, 2019; Arfifahani, 2018). Because green branding and green value are expected to retain direct effects on loyalty (H3 and H4), partial mediation is anticipated (Zhao et al., 2010). Hence:

H6: Green customer satisfaction mediates the positive effect of green branding on green customer loyalty.

H7: Green customer satisfaction mediates the positive effect of green value on green customer loyalty.

The resulting conceptual framework is presented in Figure 1. Solid arrows denote direct effects (H1–H5), and dashed arrows denote the indirect effects through green customer satisfaction (H6 and H7).

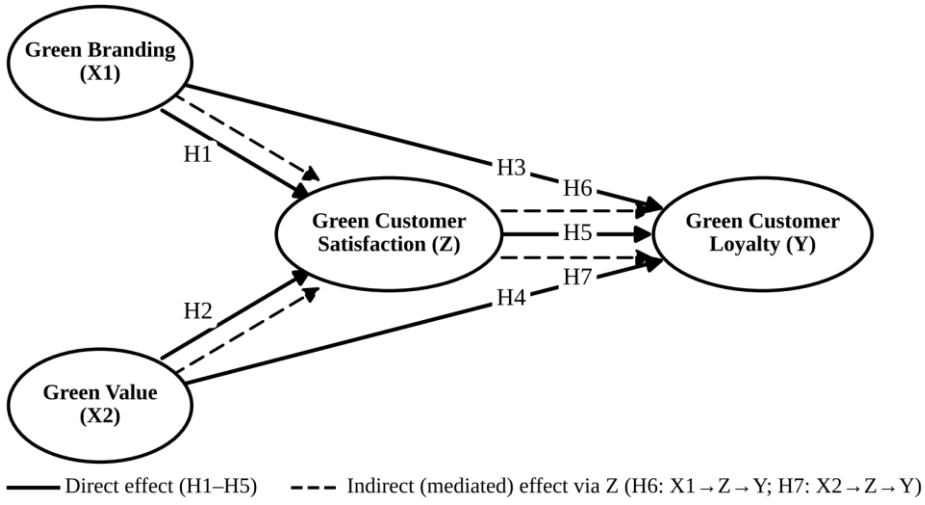


Figure 1. Conceptual framework of the study

III. METHOD

Research Design

This study employs a quantitative, explanatory (causal) research design based on a cross-sectional survey, because its purpose is to test hypothesized direct and mediated relationships among latent constructs rather than merely

to describe their levels. Green branding (X1) and green value (X2) are specified as exogenous constructs, green customer satisfaction (Z) as the mediating construct, and green customer loyalty (Y) as the endogenous outcome (Figure 1).

Population, Sampling Procedure, and Sample Size

The target population comprises consumers of eco-friendly packaged mineral water residing in six major cities on Java (Jakarta, Bandung, Surabaya, Yogyakarta, Semarang, and Tangerang), with an aggregate population of 42,645,023 inhabitants. These cities were selected because they are principal urban consumer markets on the island in terms of population and economic activity. The sample size was determined with the Slovin formula, $n = N / (1 + N \cdot e^2)$, using a 5% margin of error, which yields approximately 400 respondents (399.996). This number also exceeds the minimum requirements for PLS-SEM: the 10-times rule applied to the construct with the largest number of structural paths (three, for green customer loyalty) gives 30 observations, and a power analysis ($f^2 = 0.15$, $\alpha = 0.05$, power = 0.80, three predictors) indicates approximately 77 observations (Hair et al., 2022).

Respondents were selected through purposive sampling, a non-probability technique, using the following eligibility criteria: (1) aged at least 17 years; (2) domiciled in one of the six cities; and (3) having purchased and consumed eco-friendly packaged mineral water at least three times in the last six months. Because purposive sampling is non-probabilistic, the findings are generalizable to the analytical (theoretical) population rather than statistically to all Javanese consumers, a limitation discussed in the Limitations and Future Research section.

Data Collection and Measurement

Data were collected using a structured questionnaire. The instrument comprised a screening section, a respondent profile section, and four measurement sections containing 25 indicators: green branding (8 items; GB1–GB8), green value (6 items; GV1–GV6), green customer satisfaction (6 items; GCS1–GCS6), and green customer loyalty (5 items; GCL1–GCL5). All items were measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The constructs were operationalized according to the definitions adopted in the literature review (Table 1); green customer loyalty was measured through purchase repetition, word-of-mouth intention, and willingness to pay a premium (Gelderman et al., 2021).

Table 1. Operationalization of Constructs

Construct	Operational definition (this study)	Items
Green branding (X1)	Marketing strategy aimed at identifying and communicating the green characteristics of a brand's products to consumers	8
Green value (X2)	Consumers' evaluation of the benefits obtained from green products relative to what they sacrifice, assessed within environmental and sustainability considerations	6
Green customer satisfaction (Z)	Satisfaction arising from a product's capacity to meet consumer needs and desires in an environmentally responsible and sustainable manner	6
Green customer loyalty (Y)	Commitment to choosing green products over conventional alternatives, shown through repeat purchase and positive behavioral expressions (purchase repetition, word of mouth, willingness to pay a premium)	5

Source: Authors' operationalization based on the literature review (2026)

Data Analysis

The data were analyzed with PLS-SEM in SmartPLS 3.2.6, which is suitable for testing complex mediation models with a prediction-oriented, explanatory purpose and does not require multivariate normality (Hair et al., 2019). The analysis followed a two-step procedure. The measurement model was evaluated through indicator loadings (≥ 0.70 preferred; 0.40–0.70 retained when AVE and composite reliability thresholds are met), Cronbach's alpha, rho_A, and composite reliability (CR; all ≥ 0.70), convergent validity through the average variance extracted (AVE ≥ 0.50), and discriminant validity through the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio (< 0.90) (Fornell & Larcker, 1981; Henseler et al., 2015; Hair et al., 2019). The structural model was evaluated through collinearity (inner VIF < 5, ideally < 3), the coefficient of determination (R^2), effect size (f^2: 0.02, 0.15, and 0.35 for small, medium, and large effects), predictive relevance (Q^2 from blindfolding), and the standardized root mean square residual (SRMR < 0.08) (Hair et al., 2022).

Path significance and indirect effects were assessed through bootstrapping, at the 5% significance level (|t| > 1.96; p < 0.05). Mediation was classified following Zhao et al. (2010): complementary partial mediation when the direct and indirect effects are both significant and have the same sign, competitive partial mediation when they have opposite signs, and full mediation when only the indirect effect is significant. The variance accounted for (VAF = indirect effect / total effect) was computed as a supplementary indicator of the mediated share (Hair et al., 2022). Common method bias was examined through the full collinearity VIF of all constructs (< 3.3; Kock, 2015).

IV. RESULTS AND DISCUSSION

4.1. Results

Measurement Model Evaluation

Prior to hypothesis testing, the measurement model was evaluated. All indicators loaded on their intended constructs, with outer loadings ranging from 0.576 to 0.862 for green branding, 0.661 to 0.833 for green value, 0.809 to 0.876 for green customer satisfaction, and 0.699 to 0.870 for green customer loyalty (Figure 2; Table 3). A few indicators of green branding (lowest loading 0.576) and green value (lowest loading 0.661) fell below the preferred 0.70 level. Following Hair et al. (2019), these indicators were retained because they exceeded 0.50 and because the AVE and composite reliability of their constructs satisfied the recommended thresholds, so that content validity was not compromised. Convergent validity was supported, as the AVE of all constructs exceeded 0.50 (Hair et al., 2019). Internal consistency reliability was confirmed, as Cronbach's alpha for all constructs was well above 0.70, with green customer satisfaction showing the highest value (0.915), and composite reliability was above 0.70 for all constructs (Table 2).

Table 2. Reliability and Convergent Validity

Construct	Items	Outer loadings (range)	Cronbach's α	CR	AVE
Green Branding	8	0.576–0.862	0.888	0.911	0.569
Green Value	6	0.661–0.833	0.831	0.874	0.537

Construct	Items	Outer loadings (range)	Cronbach's α	CR	AVE
Green Customer Satisfaction	6	0.809–0.876	0.915	0.934	0.702
Green Customer Loyalty	5	0.699–0.870	0.876	0.911	0.672

Source: Research data processed using SmartPLS (2026)

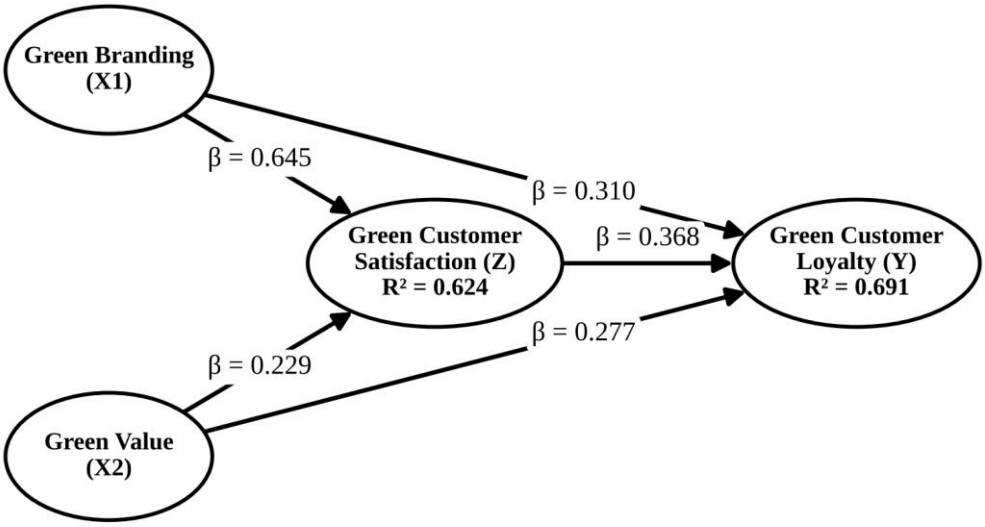


Figure 2. Structural model: standardized path coefficients and R^2 (PLS algorithm)

Hypothesis Testing

Hypothesis testing was performed through bootstrapping, generating path coefficients (β), standard deviations, t-values, and p-values for each relationship. A hypothesis was supported when $t > 1.96$ and $p < 0.05$ (Hair et al., 2019). As shown in Table 6, all seven hypotheses were supported ($p < 0.001$). Among the direct effects, green branding had the strongest influence on green customer satisfaction (β = 0.645, t = 13.354), about 2.8 times that of green value (β = 0.229). Green customer satisfaction had the strongest direct effect on green customer loyalty (β = 0.368, t = 6.286), followed by green branding (β = 0.310) and green value (β = 0.277). The bootstrapping results are visualized in Figure 3.

Table 3. Hypothesis Testing Results

Hypothesis	Path	β	Std. Dev.	t-value	p-value	Decision
H1	Green Branding → Green Customer Satisfaction	0.645	0.048	13.354	< 0.001	Supported
H2	Green Value → Green Customer Satisfaction	0.229	0.046	4.966	< 0.001	Supported
H3	Green Branding → Green Customer Loyalty	0.310	0.056	5.554	< 0.001	Supported
H4	Green Value → Green Customer Loyalty	0.277	0.056	4.977	< 0.001	Supported
H5	Green Customer Satisfaction → Green Customer Loyalty	0.368	0.059	6.286	< 0.001	Supported
H6	Green Branding → Green Customer Satisfaction → Green Customer Loyalty	0.237	0.044	5.382	< 0.001	Supported
H7	Green Value → Green Customer Satisfaction → Green Customer Loyalty	0.084	0.021	3.976	< 0.001	Supported

Source: Research data processed using SmartPLS (2026). H1–H5 are direct effects; H6–H7 are specific indirect effects.

Mediation Analysis

Table 4 decomposes the effects of the two antecedents on green customer loyalty. Both direct and indirect effects were significant and positive, so green customer satisfaction partially mediates (complementary partial mediation) the effect of both green branding and green value (Zhao et al., 2010). The indirect effect accounted for 43.3% of the total effect of green branding (VAF = 0.237 / 0.547) but only 23.3% of the total effect of green value (VAF = 0.084 / 0.361), which indicates that satisfaction is a more important channel for green branding than for green value. In terms of total effects, green branding (0.547) exerted a stronger influence on loyalty than green value (0.361).

Table 4. Direct, Indirect, and Total Effects on Green Customer Loyalty

Antecedent	Direct effect	Indirect effect (via GCS)	Total effect	VAF (%)	Mediation type
Green Branding	0.310	0.237	0.547	43.3	Complementary partial
Green Value	0.277	0.084	0.361	23.3	Complementary partial

Source: Research data processed using SmartPLS (2026); total effects and VAF were calculated from the reported coefficients. GCS = green customer satisfaction.

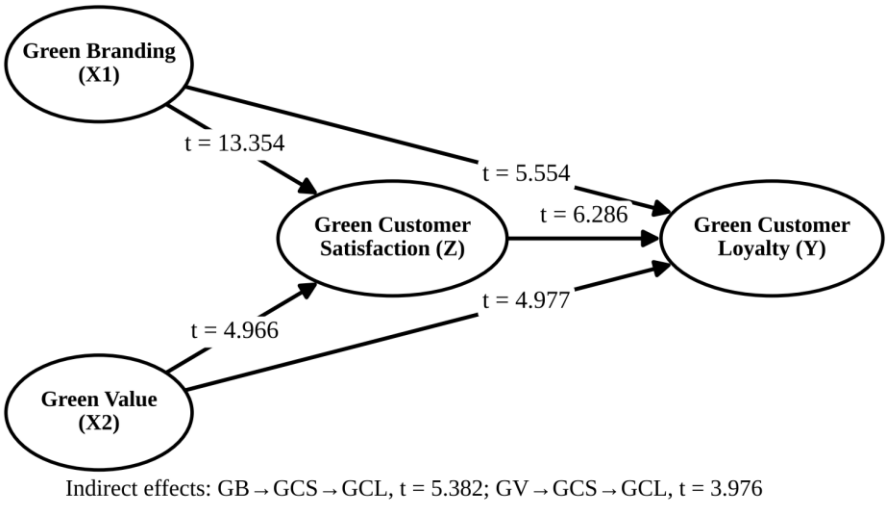


Figure 3. Bootstrapping results: t-values of the structural paths

4.2. Discussion

The results support the integrated signaling–value–confirmation logic proposed in this study: all seven paths are significant, and the model explains 62.4% of the variance in green customer satisfaction and 69.1% of the variance in green customer loyalty. This section interprets each relationship in light of the underlying theories and compares the findings critically with previous studies, many of which were conducted in international contexts and in service industries.

The Effect of Green Branding on Green Customer Satisfaction

Green branding exerts a significant positive effect on green customer satisfaction in the context of environmentally friendly packaged mineral water products on the island of Java. This finding indicates that as firms intensify their

green branding efforts, consumers respond by demonstrating elevated levels of green customer satisfaction toward the product in question. This relationship suggests that consumers genuinely value and derive greater satisfaction from brands that visibly demonstrate environmental responsibility. Branding plays a particularly consequential role in predicting the extent to which consumers will experience satisfaction with a given product or service, as consumers frequently rely upon brand identity as a primary heuristic for evaluating product quality, reliability, and the anticipated level of satisfaction to be derived from consumption. Consequently, brand reputation carries significant implications for green customer satisfaction outcomes. When consumers recognize and identify with a brand that maintains a credible and consistent commitment to environmental issues, their satisfaction with the brand's green products tends to increase correspondingly. The present finding is consistent with the results of several prior empirical studies, including the study conducted by Tiwari (2023), Nguyen-Viet (2022), Ikramayosi et al. (2022), Savitri and Marlena (2023), Steven and Pratiwi (2020), and Dipa and Pratama (2017).

The path from green branding to green customer satisfaction ($\beta = 0.645$) is the largest in the model, about 2.8 times that of green value ($\beta = 0.229$). From a signaling perspective, this suggests that in a category where environmental attributes are credence attributes and greenwashing is a salient concern, brand-level signals are the primary cue through which consumers form expectations of environmental performance and, once these expectations are confirmed, experience satisfaction (Spence, 1973; Oliver, 1980). The result is in line with studies in Indian banking (Tiwari, 2023) and Vietnamese green marketing (Nguyen-Viet, 2022), which identify brand-related constructs as important antecedents of green customer outcomes. However, most of these studies were conducted in services or branded personal-care contexts in which brand image carries rich symbolic meaning. The strong coefficient found here suggests that even in a low-involvement and functionally homogeneous category such as bottled water, the brand remains the dominant heuristic when product differences are difficult to verify. This interpretation should be treated with caution, because green branding and satisfaction were both self-reported and may share a common evaluative perception of the same brand.

The Effect of Green Value on Green Customer Satisfaction

The provision of green value significantly enhances the level of green customer satisfaction among consumers of green products. The implementation of strategies directed toward improving product quality or incorporating additional features into products or services enables firms to more effectively fulfill consumer needs and desires. The concept of value refers to the extent to which a product or service satisfies consumer needs relative to the costs incurred in obtaining it. The strategic importance of green value further resides in its capacity to differentiate a firm's offerings from those of its competitors. In an increasingly competitive marketplace, consumers are progressively seeking products that not only fulfill functional requirements but also align with the environmental values they personally espouse. Consequently, firms that succeed in effectively communicating and embodying green value within their products and services are better positioned to attract and retain environmentally conscious consumers. By fulfilling the dimensions and indicators of green value, firms can achieve a significant enhancement in green customer satisfaction. This finding is consistent with the results of several prior empirical studies that have demonstrated a significant positive relationship between green value and green customer satisfaction. Previous studies that support this finding include, Liu et

al. (2020), Pahlevi and Suhartanto (2020), Han et al. (2018), Karunaratna and Kumara (2018), Paulose and Shakeel (2022), and Issock et al. (2020).

Although significant, the effect of green value on satisfaction (β = 0.229) is considerably weaker than that of green branding. Two explanations are plausible. First, green value is a benefit–sacrifice evaluation (Zeithaml, 1988), and Mustonen et al. (2016) argue that sacrifice-related factors such as price weigh heavily in perceived value; in a price-sensitive market in which bottled water is a frequently purchased commodity, consumers may regard ecological benefits as secondary to price and convenience, which attenuates the satisfaction gained from green value. Second, the ecological benefits of water packaging are difficult to experience directly, so their contribution to satisfaction may depend on credible communication, that is, on branding. Positive effects of value on satisfaction have also been reported for cruise and hotel guests (Han et al., 2018; Paulose & Shakeel, 2022) and for eco-friendly plastic products in Indonesia (Pahlevi & Suhartanto, 2020), which suggests that the direction of the effect is robust across contexts while its magnitude may depend on how tangibly value is experienced.

The Effect of Green Branding on Green Customer Loyalty

Green branding exerts a significant positive effect on green customer loyalty in the context of environmentally friendly packaged mineral water products on the island of Java. This finding demonstrates that an effectively executed green branding strategy has the capacity to meaningfully strengthen customer loyalty. The relationship underscores the tendency of customers to remain committed to brands that visibly and credibly demonstrate environmental responsibility through their branding efforts. Green branding encompasses the deployment of symbols, names, and design elements that communicate a brand's dedication to sustainability and environmentally responsible practices. These elements resonate deeply with environmentally conscious consumers, enhancing their emotional connection to and trust in the brand. When consumers perceive that a brand is genuinely aligned with their personal environmental values and actively contributes to ecological preservation, they are significantly more inclined to develop a strong and enduring sense of loyalty toward that brand. This finding is consistent with the results of several prior empirical studies, including those conducted by Danko and Nifatova (2022), Saragih and Prayitta (2023), Fernando et al. (2017), Tanwari (2020), and Biswas (2022).

Green branding retains a significant direct effect on loyalty (β = 0.310) even when satisfaction is controlled, which indicates that a brand's environmental identity builds loyalty not only through experienced satisfaction but also through identification and trust that operate independently of consumption outcomes. This corroborates Fernando et al. (2017), who report green branding as a leading determinant of loyalty in Sri Lankan supermarkets, and Danko and Nifatova (2022), who link green branding to loyalty and price premiums in the agri-food sphere. A more critical reading is nevertheless warranted: the direct effect of green branding (β = 0.310) is smaller than that of satisfaction (β = 0.368), so the claim that green branding is the most powerful determinant of loyalty holds in this study only for its total effect (β = 0.547), not for its direct effect alone.

The Effect of Green Value on Green Customer Loyalty

The green value perceived by consumers represents their evaluative assessment of the benefits received from a product relative to the sacrifices made in acquiring it, calibrated against their individual needs and expectations.

When consumers perceive that the benefits derived from a green product are commensurate with the costs expended, they are more inclined to remain loyal to the brand and less motivated to seek alternative offerings. Consumers who are well-informed regarding the green value attributes of a product will tend to sustain their loyalty toward that brand, as they develop a meaningful connection with the quality and environmental integrity that the brand represents and consistently delivers. This finding is consistent with the results of several prior empirical studies that have demonstrated a significant positive relationship between green value and green customer loyalty. Previous studies that support this finding include, Mustonen et al. (2016), Liu et al. (2020), Pahlevi and Suhartanto (2020), Dabija and Bejan (2019), Karunaratna and Kumara (2018), and Paulose and Shakeel (2022).

The direct effect of green value on loyalty (β = 0.277) is of similar magnitude to that of green branding (β = 0.310), which indicates that consumers who perceive favorable net green benefits are inclined to repurchase and recommend the product over and above their satisfaction. This supports Mustonen et al. (2016) and Pahlevi and Suhartanto (2020), who identify value as a driver of loyalty. The contrast between the weak effect of green value on satisfaction (H2) and its comparable direct effect on loyalty implies that value-driven loyalty in bottled water may be partly calculative (price–benefit based) rather than affective. This conjecture should be tested in future research by estimating the loyalty dimensions (repurchase, word of mouth, and willingness to pay a premium) separately.

The Effect of Green Customer Satisfaction on Green Customer Loyalty

Green customer satisfaction exerts a significant positive effect on green customer loyalty in the context of environmentally friendly packaged mineral water products on the island of Java. This finding demonstrates that organizational efforts to enhance green customer satisfaction through effective and credible environmentally responsible practices play a meaningful role in retaining existing customers and strengthening their loyalty over time. Consumer satisfaction derived from green product experiences contributes significantly to the cultivation of green customer loyalty, as satisfaction reflects the degree to which consumer preferences and expectations are fulfilled by a particular brand or product. Customer satisfaction thus functions as a foundational determinant of loyalty, establishing the affective and evaluative basis upon which sustained consumer commitment is built. This finding is consistent with the results of several prior empirical studies, including those conducted by Pahlevi and Suhartanto (2020), Sun et al. (2022), Assaker et al. (2020), Gelderman et al. (2021), Tiwari (2023), Nguyen-Viet (2022), and Cavusoglu et al. (2021).

Satisfaction is the strongest direct predictor of loyalty in the model (β = 0.368), consistent with expectation–confirmation theory (Oliver, 1980) and with evidence from hotels (Assaker et al., 2020; Sun et al., 2022), business-to-business markets (Gelderman et al., 2021), and banking (Tiwari, 2023). The coefficient is moderate rather than dominant, however, which implies that satisfaction is necessary but not sufficient for green loyalty: a considerable share of loyalty is explained by the direct effects of branding and value. In a category with low switching costs and abundant substitutes, satisfaction alone may not secure repurchase, which explains why brand-based and value-based mechanisms still contribute directly. Differences in the strength of this link across studies probably reflect differences in product involvement, switching barriers, and the measurement of loyalty.

The Effect of Green Branding on Green Customer Loyalty through Green Customer Satisfaction

Green branding exerts a significant positive effect on green customer loyalty through the mediating role of green customer satisfaction in the context of environmentally friendly packaged mineral water products on the island of Java. When customers perceive that a brand's environmental initiatives are genuinely aligned with their personal ecological values and successfully meet their expectations, their satisfaction with the brand is meaningfully enhanced. This elevated satisfaction, in turn, reinforces loyalty by fostering trust, deepening emotional connection, and consolidating consumer preference for the brand over its competitors. Green branding therefore becomes most effective as a driver of loyalty not merely when it communicates sustainability at a symbolic level, but when it delivers tangible and experiential satisfaction to consumers, thereby stimulating repeat purchase behavior and generating positive word-of-mouth recommendations. This finding is consistent with the results of several prior empirical studies, including those conducted by Tiwari (2023), Damayanti and Wahyono (2015), Awal et al. (2018), and Tyas (2020).

The indirect effect of green branding through satisfaction is significant (β = 0.237; t = 5.382) and accounts for 43.3% of its total effect (0.547). Because the direct effect (β = 0.310) is also significant and has the same sign, the mediation is complementary partial (Zhao et al., 2010). Mechanistically, green branding sets and credibly anchors expectations about environmental performance (signal); when the product experience confirms these expectations, satisfaction arises and consolidates repurchase and advocacy (expectation–confirmation). The partial nature of the mediation implies a second, non-satisfaction route, namely trust and identification, which is consistent with H3. The result extends studies that tested satisfaction as a mediator of image and branding effects in services and consumer goods (Tiwari, 2023; Damayanti & Wahyono, 2015; Awal et al., 2018; Tyas, 2020) to the case of green brands in an emerging-market packaged-water category, and it quantifies the share of the effect that operates through satisfaction rather than assuming full mediation.

The Effect of Green Value on Green Customer Loyalty through Green Customer Satisfaction

Green value exerts a significant positive effect on green customer loyalty through the mediating role of green customer satisfaction in the context of environmentally friendly packaged mineral water products on the island of Java. This finding reveals that the pathway through which green value translates into enduring consumer loyalty is not exclusively direct, but is substantially mediated by the satisfaction experience that consumers derive from their green product consumption. When consumers perceive that a green product delivers meaningful ecological and functional value commensurate with the costs they have incurred, their satisfaction with the product is correspondingly elevated. This heightened state of green customer satisfaction subsequently serves as a powerful catalyst for the consolidation of loyalty, as satisfied consumers are significantly more inclined to engage in repeat purchase behavior, advocate for the brand through positive word-of-mouth, and demonstrate a willingness to pay a premium for the product over conventional alternatives. The mediating role of green customer satisfaction thus illuminates the psychological mechanism through which green value perceptions are converted into sustained behavioral commitment, suggesting that green value alone is insufficient to secure loyalty unless it is first internalized by consumers as a genuinely

satisfying consumption experience. Firms operating in the packaged mineral water industry on the island of Java must therefore ensure that their green value propositions are not merely communicated at a promotional level, but are substantively experienced and validated by consumers throughout the entirety of their product interaction, thereby generating the satisfaction necessary to cultivate and sustain green customer loyalty over the long term. This finding is consistent with the results of several prior empirical studies, including those conducted by Han et al. (2018), Amin and Dhewi (2021), Wahyuni and Ihsanuddin (2019), and Arfifahani (2018).

The indirect effect of green value through satisfaction is significant but small (β = 0.084; t = 3.976) and represents 23.3% of its total effect (0.361), so the mediation is also complementary partial. The small size follows directly from the weak first-stage path (β = 0.229): although satisfaction strongly affects loyalty, little of the effect of green value passes through satisfaction, and 76.7% of the total effect is direct. This pattern differs from studies that portray satisfaction as the principal channel of value effects (Han et al., 2018; Al Amin & Dhewi, 2021; Wahyuni & Ihsanuddin, 2019; Arfifahani, 2018), which were conducted largely in service-oriented settings where value is realized through a consumption experience. For a packaged product, value judgments may be formed at the point of purchase and translated directly into repurchase. Managerially, this suggests that green value should be communicated and delivered at the point of purchase rather than relied upon to generate satisfaction after use.

Theoretical Implications

First, the results support an integrated signaling–perceived value–expectation–confirmation account of green loyalty: all seven paths are significant, and the model explains 69.1% of the variance in loyalty. Second, by separating direct, indirect, and total effects, the study shows that satisfaction is a partial rather than a full mediator for both antecedents, which challenges the assumption in much of the green loyalty literature that satisfaction is the sole conduit through which green attributes influence loyalty. Third, the contrast between the strong green branding–satisfaction path and the weak green value–satisfaction path suggests that, for credence attributes, the credibility of signals takes precedence over value evaluation in forming satisfaction, which refines value-based models developed mainly in experiential service contexts.

Managerial and Policy Implications

Four evidence-based implications follow. First, firms should prioritize credible green branding: because green branding has the largest effect on satisfaction (β = 0.645) and the largest total effect on loyalty (0.547), investments should go first to verifiable signals such as recognized certifications, recyclability information, and transparent packaging claims, and claims must be substantiated to avoid greenwashing. Second, brand promises must be converted into experience: since 43.3% of the effect of green branding operates through satisfaction, product quality, packaging performance, and after-use arrangements (e.g., collection and recycling) should deliver what the brand communicates. Third, green value should be treated as a loyalty lever rather than a satisfaction lever: 76.7% of its effect is direct, so pricing and benefit communication (e.g., refill or bulk formats and return incentives) should make net green benefits visible at the point of purchase. Fourth, regulators can strengthen green labeling standards and their verification, because consumers appear to depend heavily on brand-level signals; credible, standardized labels would reduce information asymmetry and protect honest green brands. These

recommendations derive from the estimated path coefficients and should be weighed against implementation costs.

Limitations and Future Research

Several limitations should be acknowledged. First, purposive sampling in six large cities limits statistical generalization to all Javanese or Indonesian consumers; probability or quota sampling stratified by city and income is recommended. Second, the cross-sectional, self-reported design cannot establish causality and may be affected by common method bias; longitudinal or experimental designs and behavioral data (e.g., actual repurchase) would strengthen causal inference. Third, the model is parsimonious: green trust, perceived greenwashing, environmental concern or knowledge, and price sensitivity may mediate or moderate the relationships (Issock et al., 2020), and the weak association between green value and satisfaction suggests that the measurement of green value should be refined (Han et al., 2018). Fourth, loyalty was modeled as a single construct; future research could test its attitudinal and behavioral dimensions separately and compare brands, product categories, and countries.

V. CONCLUSION

This study examined the effects of green branding and green value on green customer loyalty through the mediating role of green customer satisfaction among consumers of eco-friendly packaged mineral water on Java. All seven hypotheses were supported ($p < 0.001$). Green branding had the strongest effect on green customer satisfaction ($\beta = 0.645$) and the largest total effect on green customer loyalty (0.547), whereas green value had smaller effects ($\beta = 0.229$ on satisfaction; total effect on loyalty = 0.361). Green customer satisfaction was the strongest direct predictor of loyalty ($\beta = 0.368$) and partially mediated both relationships, accounting for 43.3% of the effect of green branding and 23.3% of the effect of green value. The model explained 62.4% of the variance in satisfaction and 69.1% in loyalty. These findings indicate that credible brand-level environmental signals, converted into satisfying consumption experiences, are the most effective route to green customer loyalty in this market.

Recommendations

For Managerial

Packaged mineral water firms should (1) invest first in verifiable green brand signals (certifications, recyclability information, and transparent packaging claims) supported by genuine ecological practices; (2) ensure that product quality and packaging performance confirm the brand's environmental promise so that satisfaction is realized; and (3) make net green benefits visible at the point of purchase, since most of the effect of green value on loyalty is direct.

For Policy

Regulators are encouraged to strengthen the standardization and verification of green product labeling and to run consumer education campaigns, thereby reducing information asymmetry and protecting consumers and credible green brands from greenwashing.

For Future research

Future studies should test the framework with probability samples, other product categories, and other countries; add green trust, perceived greenwashing, environmental concern, and price sensitivity as mediators or

moderators; refine the measurement of green value and green loyalty (Han et al., 2018); and employ longitudinal or experimental designs.

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