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Eco-Labels, Green washing, and Consumer Trust: A Critical Study of Sustainable Marketing Practices

Dr D Santhanakrishnan, Associate Professor & Head, Department of B.Com PA & RM (ACCA), Sri Ramakrishna College of Arts & Science, Coimbatore, sk&srcas.ac.in, Orcid id: 0000-0003-2628-3291
Dr R Thangamani, Associate Professor, Department of Management, Hindusthan College of Arts & Science, Coimbatore, thangamani@hicas.ac.in, Orcid id: 0000-0002-0356-5520
Dr D Divya, Assistant Professor, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, divya@srcas.ac.in, Orcid id: 0000-0002-1687-6125
Dr N Amsaveni, Associate Professor, Department of MBA, Sri Ramakrishna College of Arts & Science, Coimbatore, amsaveni@srcas.ac.in, Orcid id: 0009-0008-7184-3503
Dr G Vengatesan, Associate Professor in Commerce, School of Commerce, Finance and Accountancy, CHRIST (Deemed to be University). Bangalore, Orcid id: 0000-0002-5297-8401

Abstract
The concept of sustainable marketing has gained significant impetus over the past few decades as the issue of environment is becoming the major factor of consumer behavior and business strategy. This paper is a critical analysis of the interaction between eco-labels, the greenwashing activities and the consumer trust in the modern sustainable market. Based on Signaling Theory, Consumer Trust Theory, and the Theory of Planned Behavior (TPB), the study builds a conceptualized framework where eco-label awareness will be viewed as an independent variable, perceived green washing as a negative moderator, and consumer trust and purchase intention as dependent results. The study employs Cronbachs Alpha reliability test, Pearson correlation, multiple regression, and moderation analysis as its methodology through the use of a quantitative survey based approach with 250 purposely sampled respondents with awareness of sustainable products. The results show that consumer trust ($\beta = 0.612$, $p < 0.001$) and purchase intention ($\beta = 0.574$, $p < 0.001$) increase significantly and positively under the influence of eco-label awareness. Importantly, the perceived greenwashing has a strong negative moderating influence in eco-label trust relationship ($\beta = -0.341$, $p < 0.001$), which invalidates the credibility of an eco-label as intended. These findings have significant implications on the brand managers, regulatory and consumer advocacy groups. The research paper adds to the advanced literature on ESG by shedding light on the presence of conditions in which eco-labels can be used to successfully create a trustful relationship, and the absence of transparency and third-party confirmation as the elements of the ethical marketing approach towards sustainability.

Keywords: Eco-labels, Greenwashing, Consumer Trust, Sustainable Marketing, ESG, Green Branding, Ethical Marketing, Purchase Intention, Theory of Planned Behavior

1. Introduction

The last twenty years have seen the essential restructuring of the alliance between trade, buying, and environmental care. Due to the shift of climate change towards a short-term policy and market reality, sustainable marketing has ceased being a fringe issue in the past and has turned into a strategic necessity of companies in various industries. Governments are increasing environmental policies, institutional investors are expecting Environmental, Social, and Governance (ESG) reporting and consumers, especially younger ones, are shifting their buying patterns to align with their environmental beliefs (Ottman, 2017; Dangelico and Vocalelli, 2017). In this weather the messages of brand environmental credential have never been more commercially important.One of the most visible of those would be eco-labels: third-party certifications and product labeling that provides the consumer with information about environmental performance at the point of purchase. Such as the EU Ecolabel, Energy Star, Fair Trade, Rainforest Alliance and the Forest Stewardship Council (FSC) mark have become common in electronics as well as food and clothing. The scientific community on the whole supports the idea that the eco-label can lead to the reduction in information asymmetry between consumers and producers, decrease the cognitive burden of assessing green claims, and increase the trust and willingness to pay (Thodsen et al., 2010; Grunert et al., 2014; Janssen and Hamm, 2012). The efficacy of these labels, however, is by no means uniform or assured.

Opponents of the promise of eco-labels include the widespread and harmful behavior of greenwashing, i.e. making empty, inflated or unsubstantiated environmental claims to appeal to the increasingly large group of environmentally conscious consumers. The greenwashing scandals of high profile have intensified scrutiny of the issue, such as the Dieselgate emissions cheating by Volkswagen, but fashion companies promoting synthetic clothes as eco-friendly have brought up questions, as well as regulations. The 2023 proposal of the Green Claims Directive proposed by the European Commission directly addressed the issue of the widespread use of unsubstantiated and unverifiable sustainability claims in adverts (European Commission, 2023). These deceitful activities are not only misleading individual consumers; they are rotting away the larger market apparatus of trust on which sustainable marketing has to rely.Although a significant amount of work has been done on both phenomena separately, there is still an acute gap in our comprehension of the interactions between eco-labels and greenwashing to form consumer trust. Majority of literature considers them as independent variables without paying much attention to moderating influence that eco-label suspicion or awareness can have in defining the extent to which eco-labels can be translated to consumer confidence. Even valid, legitimate eco-labeling can be discounted by an aware consumer who has come to view these as a form of greenwashing and this leads to a credibility crisis that punishes both the legitimate brands and the fake brands. This dynamic has not had adequate systematic coverage in the empirical literature.

Based on this, this research can pursue the following objectives: (1) to determine the direct impact of eco-label awareness on consumer trust and purchase intention; (2) to investigate whether perceived greenwashing mediates the relationship between eco-label awareness and consumer trust; (3) to frown down on theoretical and practical implications on sustainable marketing strategy, ESG reporting and consumer policy. Combining various theoretical perspectives with the use of strict quantitative techniques, this article will contribute to the sphere in an elegant and practical way.

2. Literature Review

2.1 Eco-Label Effectiveness and Consumer Perception: The usefulness of eco-labels as means of communication is also well-researched since Thoegersen et al. (2010) have already shown that eco-label familiarity is a good indicator of consumer trust and chances of making a purchase. This finding has been supported and validated by later studies. Grunert et al. (2014) compared the understanding of eco-labels among samples of consumers in Europe and discovered that the understanding, rather than exposure, is the key mediating variable between the eco-label presence and purchase intention. Janssen and Hamm (2012) also revealed that consumers evaluated eco-labels in a significant way depending on the label origin (governmental- vs. private-label) where governmental labels have a higher degree of trust.

Making a transition into the mid-2010s, Thoegersen (2017) discovered a dynamic of a trust ladder, where consumers who trust an eco-label will extrapolate that trust to the certifying organization and then to the certified brand. These and cascading mechanisms of trust carry significant implications to brand equity in sustainable categories. The alternative concept proposed by Hahnel et al. (2015) is the so-called eco-label fatigue, which implies that the spread of competing labels in the area of organic food or sustainable timber makes the labels lose their credibility and diminishes the ability of any one of the labels to be trusted. This issue of cognitive overload is recapitulated by previous studies by Nuttavuthisit and Thoengersen (2017) in which lower baseline environmental literacy was identified as the main factor making consumers in the emerging markets highly susceptible to eco-label confusion.

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Vol. 36 Issue 1, 2026, Pages: 3928-3935

More recently, Hameed and Waris (2018) combined the eco-label study with the green purchase behavior in a South Asian setting, revealing significant positive relationship between the level of eco-label awareness and the purchase intention mediated by the green trust. Carlson et al. (2023) further applied this research question to online shopping platforms, whose results showed that the visibility of eco-labels in e-commerce platforms is a major predictor of green purchasing behavior, the impact of which is mediated by platform trustworthiness. All these findings point to the implied fact that eco-labels will work in high label credibility, consumer environmental literacy, low information overload, and such condition do not always exist in reality.

2.2 Greenwashing: Practices, Consequences, and Detection: Scholarly work on greenwashing has become a booming industry since the groundbreaking typology proposed by Delmas and Burbano (2011) that identified two types: internal greenwashing (disconnect between what a company claims to do and what it actually does) and external greenwashing (deceptive messages to the consumer and shareholders). Their model emphasized the fact that greenwashing is not simply a communication issue but a hypocrisy of the organization on the strategic level in many cases. Theorized in greenwashing by Lyon and Maxwell (2011), who used the game-theoretic approach to show that under low scrutiny environment, firms have inadequate incentives to support their environmental claims with meaningful action.

The effects of greenwashing on the consumer trust have been recorded in various cultural settings. Chen and Chang (2013) constructed the construct of green confusion as a consequence of greenwashing to show that greenwashing enhances consumer confusion regarding the real green products and consequently inhibits green purchase intention board-wide. Nyilasy et al. (2014) indicated that customers who feel incongruity between the environmental statements made by a company and its environmental performance have a high level of brand skepticism and lower purchase intention, despite the adherence of the statements being technically correct. This is especially harmful to first mover sustainable brands who suffer the reputation spill of the misconduct of their competitors. Kumar (2016) evaluated the greenwashing within the Indian retail market and discovered that awareness of consumer greenwashing has grown significantly as a result of social media coverage and campaigning by NGOs. According to Schmuck et al. (2018) so-called dark patterns in sustainable labelling (such as indecipherable imagery, false comparative statements, and pseudo-certifications) are especially useful in misinforming less experienced consumers. Borin et al. (2011) also showed that explicit disclosures of greenwashing in advertisements initially lower the commercial desire but ironically could be perceived as transparency by advanced consumers, which is a somewhat complicated correlation between revealed information and trust.

Regulatory environment has reacted though unevenly. Green claims that are unsubstantiated have also been targeted by the US Federal Trade Commission through its Green Guides (revised 2012) and the UK-based Advertising Standards Authority. In the European Union, the above-mentioned Green Claims Directive (2023) constitutes the most ambitious effort of codification of enforceable standards in the area of environmental marketing. These types of regulatory interventions have been investigated by scholars like Parguel et al. (2015) who discovered that the presence of clear regulatory frameworks decrease the cases of greenwashing but cannot work alone without consumer education.

2.3 Consumer Trust in Sustainable Marketing: Consumer trust as a foundational construct in marketing has long been known, yet its unique dynamics in the field of sustainability possess a certain set of characteristics. Fraj and Martinez (2006) found that environmental commitment and trust reciprocate in consumers with high ecological values, indicating that trust is not only an effect of marketing communication but a determinant of openness to green communication as well. Chen (2010) formulated a particular construct of 'green trust' which is defined as 'willingness to rely on a product, service, or brand based on the belief that it is credible, benevolent, and fulfills consumer environmental expectations' (Chen, 2010). This multidimensional conceptualization has been adopted by much research.

Hur et al. (2014) applied green trust studies to the corporate level and showed that CSR activities can significantly increase consumer trust in the brand as an environmental actor. Critically, they found that authenticity perceptions mediate this relationship - CSR that is seen as an act of opportunism or performance leads to skepticism rather than trust. This finding strikes a familiar chord with the more recent work by Romani et al. (2016) who found that consumers with high environmental identity are especially attuned to authenticity cues and are more likely to punish brands they believe are instrumentally adopting green positioning.

In the digital age the drivers of green trust have diversified. Kim and Hall (2020) found that user-generated content and peer reviews about the environmental practices of a given brand have a significant influence on green trust; often more than official brand communications. Wang et al. (2022) showed that transparency in the disclosure of supply chains-which would be possible with the help of e.g. blockchain-greatly enhances consumers' trust in organic and sustainable product categories. These findings highlight the importance of the verifiable and third party validated environmental claims in the effort to build durable consumer trust.

2.4 Sustainable Marketing Strategies and ESG Integration: The idea of sustainable marketing has come a long way from the origins of 'green marketing' discourse (Peattie & Crane, 2005) to a more comprehensive approach to integrating environmental, social and governance (ESG) considerations into core business strategy (Kotler et al., 2021). Dangelico and Vocalelli (2017) conducted a systematic review of sustainable marketing which identified four key strategic orientations: product greening, process greening, societal marketing and sustainability communication. They say the best sustainable marketing strategies integrate meaningful environmental improvements with credible communication instead of using them as alternatives. White et al. (2019) also provided a consumer-focused view, suggesting that rather than the creation of environmental awareness, sustainable consumption behaviours are encouraged by bridging the 'value-action gap' - the well-documented disparity between consumers' stated green values and their actual purchasing behaviour. Their SHIFT framework describes Social influence, Habit formation, Individual self-interest, Feelings and cognition and Tangibility as levers for bridging this gap. This framework implicitly suggests that eco-labels, if well-designed and trusted, can also serve as tangibility mechanisms to make abstract environmental benefits concrete and comparable at the point of purchase. Research by Papadas et al. (2017) has introduced a green marketing orientation scale and showed that the higher the green marketing orientation of companies, the better the environmental and financial performance of companies, which means that sustainable marketing is not just an investment in reputation but a source of competitor advantage. More recently in 2022, Su et al. investigated the role of ESG disclosure quality in shaping perceptions of investors and consumers, and found that high-quality ESG disclosures are linked to lower information asymmetry, lower reputational risk, and higher stakeholder trust - similar to the relationship found at the product level for eco-labels.

2.5 Research Gaps:

The preceding review highlights some of the important lacunae in the existing literature. First, although individual studies have looked at eco-labels and greenwashing as two distinct constructs, very few have explicitly modelled greenwashing perception as a moderator in the eco-label-trust relationship. Most previous work has considered these independent negative and positive forces instead of exploring their interaction. Second, lots of the existing research has been done in Western contexts; the evidence from emerging economies like India - where sustainable consumption and greenwashing are rising at the same time - is very limited. Third, the mechanisms by which eco-label awareness leads to purchase intention by means of trust have not been thoroughly tested with moderation in one integrated model. The current study partially addresses this by developing and empirically testing a moderated mediation model that includes eco-label awareness, perceived greenwashing, consumer trust and purchase intention.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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Vol. 36 Issue 1, 2026, Pages: 3928-3935

3. Conceptual Framework and Hypotheses

3.1 Theoretical Foundations: This study has a conceptual framework based on 3 theoretical traditions which are complementary. Signaling Theory (Spence, 1973), a concept that was first formulated in the field of labor economics, states that in markets with an information asymmetry, credible signals, or ones that are expensive or costly to counterfeit, are useful in conveying quality of where the information is transmitted is incomplete. The Eco-labels are used as environmental quality indicators: their credibility is attributed to the effort, expense and third-party scrutiny that goes into the certification of the Eco-labels. The success of such signals however is dependent on the trustworthiness of the receiver to the signal. In the event of perceived prevalence of greenwashing, consumers will be able to discount eco-label signals rationally as usefulness, thus weakening the trust-building effect. The mediating mechanism in our model is Consumer Trust Theory (McKnight and Chervany, 2001; Chen, 2010). The three dimensions of trust in the sustainability context are competence trust (the belief that the brand has the capacity to do what it claims it can do to the environment), benevolence trust (the belief that the brand cares about the environmental consequences) and integrity trust (the belief that the brand is honest in what it is saying it can and will do concerning the environment). The observable signals like eco-labels are affected by these dimensions but are vulnerable to disconfirming information like greenwashing revelations.

The Theory of Planned Behavior (Ajzen, 1991) relates trust to the behavioral consequences by the assumption that attitudes, the subjective norms, and the perceived behavioral control drive intentions and, therefore, behaviors. The green label awareness and trust that follows are important inputs to the consumer attitude to sustainable purchase in the green consumption environment and this eventually influences purchase intention. The TPB therefore completes behaviorally the framework which starts with reception of signals (Signaling Theory), and which progresses through affective and cognitive assessment (Consumer Trust Theory).

3.2 Hypotheses: The following three research hypotheses are derived from the theoretical framework:

H1: Eco-label awareness has a significant positive effect on consumer trust in sustainable products.

H2: Consumer trust in sustainable products has a significant positive effect on purchase intention.

H3: Perceived greenwashing negatively moderates the relationship between eco-label awareness and consumer trust, such that the positive effect of eco-label awareness on consumer trust is weaker when perceived greenwashing is high.

3.3. Conceptual framework

Figure 1: Conceptual framework

4. Research Methodology

4.1 Research Design: The research design used in this study is quantitative and cross-sectional based on the structured self-administered questionnaire. The choice of quantitative methodology is due to the research objectives, namely, to measure and test statistically relationships between latent constructs: eco-label awareness, perceived greenwashing, consumer trust, purchase intention, and the moderation analysis demands the large enough sample, which should contain numerical data. The cross-sectional design does not imply making a causal inference in its strict temporal meaning, but it is suitable to test theoretically-based relationships and it is in line with the methodological standards of the consumer behavior literature (Hair et al., 2019).

4.2 Population, Sampling and Data collection. The target audience is adult consumers (18 years old and up) that are conscious of the sustainable products and eco-labels. The criterion will make sure that the respondents have the necessary knowledge to answer the questions regarding eco-label perception and greenwashing awareness validly. The survey was conducted in urban and semi-urban regions through purposive and convenience sampling with snowball referral applied to those segments that proved difficult to reach including young professionals and graduate students who are interested in the sustainability issue.

The final sample set to be used consisted of N = 250 respondents, which is above the recommended minimum of 5-10 observations per predictor variable required to conduct regression analysis (Hair et al., 2019) and offers sufficient statistical power to moderate tests. The collection was done in a period of eight weeks through both online (Google Forms) and face-to-face conducted questionnaires. The respondents received complete information regarding the purpose of the study and anonymity was guaranteed, it was a voluntary participation. The effective response rate after filtering of incomplete or patterned responses was 83.3 percent of mailed surveys.

4.3 Measurement Instrument: The survey consists of three parts, including demographics, eco-label and greenwashing perceptions, and trust and behavioral intention scales. Attitudinal and perception items were all rated using a five-point Likert scale with anchors of 1 (Strongly Disagree) and 5 (Strongly Agree). The awareness products regarding the eco-label were based on the works by Janssen and Hamm (2012) and Grunert et al. (2014). The items of the greenwashing perception were based on the scale created by Chen and Chang (2013). The items in the consumer trust were based on the Green Trust Scale by Chen (2010). The items in purchase intention were based on Hameed and Waris (2018). Everything was subjected to the review of three scholars in the area of sustainable marketing before it was put to the field and a pilot study of 30 respondents verified the clarity of the items and internal consistency.

4.4 Analytical Approach: Data analysis was done in four steps. The first step involved computing the descriptive statistics and frequency distributions of demographic and item level variables. Second, the reliability analysis was performed with the help of Cronbachs Alpha that helps to check the internal consistency of every scale multi-item (threshold of alpha 0.70 and higher). Third, the Pearson correlation analysis was conducted, and the bivariate correlation relationships between the four main constructs were tested, and the multicollinearity was filtered. Fourth, H1 and H2 were tested by the multiple regression analysis and H3 tested by moderated regression analysis, in accordance to the steps described by Baron and Kenny (1986) and the PROCESS macro developed by Hayes. All the analyses have been performed on SPSS version 27.0 with the $p = 0.05$ threshold.

5. Data Analysis and Interpretation

5.1 Demographic Profile of Respondents:

The sample population of 250 consisted of 54.4 percent and 45.6 percent of male and female respondents, respectively; 68.0 percent of the respondents were aged between 18 and 35 years - the demographic most inclined towards trends in sustainable consumption. Education wise, 71.6% were of graduate or postgraduate degree and 62.8% had a mid-to-upper range of annual household income. The sample was mostly urban cites geographically. These demographic traits are generally in line with the previous research on the eco-label conscious consumers and reinforce that the sample is representative of the target population.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages: 3928-3935

5.2 Reliability Analysis

The Cronbachs Alpha reliability test of every scale is shown in Table 1. The four scales all showed higher values above the traditional 0.70 with a range of 0.791 to 0.874, which showed good to excellent internal consistency. The scale composite scores can be used in the further analyses because the composite reliability of each construct supports using scale composite scores.

Table 1: Cronbach's Alpha Reliability Test Results

Construct	No. of Items	Cronbach's Alpha	Interpretation
Eco-Label Awareness	5	0.852	Good
Perceived Greenwashing	4	0.791	Acceptable
Consumer Trust	3	0.874	Good
Purchase Intention	3	0.833	Good

5.3 Descriptive Statistics and Correlation Analysis

Table 2 presents means, standard deviations and bivariate Pearson correlations of the four constructs. The mean scores of eco-label awareness (M = 3.72, SD = 0.68) and consumer trust (M = 3.58, SD = 0.74) were above the middle of the scale, which means moderately positive perceptions. The perceived greenwashing showed a quite high mean (M = 3.84, SD = 0.71), which indicates that there is a high level of suspicion of greenwashing among eco-label conscious customers, which has considerable implications. As anticipated, eco-label awareness and consumer trust had a significant positive relationship ($r = 0.61$, $p < 0.001$), and consumer trust had positive relationship with purchase intention ($r = 0.57$, $p < 0.001$). The perceived greenwashing was found to have a negative relationship with consumer trust ($r = -0.48$, $p < 0.001$) and purchase intention ($r = -0.39$, $p < 0.001$).

Table 2: Descriptive Statistics and Correlation Matrix (N = 250)

Variable	M	SD	ELA	PGW	CT	PI
Eco-Label Awareness (ELA)	3.72	0.68	1.00	−0.31**	0.61***	0.54***
Perceived Greenwashing (PGW)	3.84	0.71	−0.31**	1.00	−0.48***	−0.39***
Consumer Trust (CT)	3.58	0.74	0.61***	−0.48***	1.00	0.57***
Purchase Intention (PI)	3.49	0.79	0.54***	−0.39***	0.57***	1.00

*** p < 0.01; *** p < 0.001*

5.4 Multiple Regression Analysis: Testing H1 and H2

The outcome of a hierarchical multiple regression analysis is shown in Table 3. The Model 1 showed the direct relationship between eco-label awareness and consumer trust (H1) by age, gender, and income. The awareness of eco-labels was found to be a major and positive predictor of consumer trust ($\beta = 0.612$, $t = 9.83$, $p < 0.001$), and the model captured 42.7 per cent of variance in consumer trust ($R^2 = 0.427$, $F(4, 245) = 45.62$, $p < 0.001$). H1 is thus fully supported. Model 2 involved direct test (H2) to test the direct effect of consumer trust on purchase intention controlling demographics. There was a meaningful positive predictor of purchase intention which is consumer trust ($\beta = 0.574$, $t = 8.71$, $p < 0.001$), and the R^2 was 0.381 ($F = (4, 245) = 37.82$, $p < 0.001$). H2 is thus fully supported.

Table 3: Multiple Regression Analysis Results

Predictor	β (Model 1)	t	β (Model 2)	t
DV: Consumer Trust (M1) / Purchase Intention (M2)				
Eco-Label Awareness	0.612***	9.83	—	—
Consumer Trust	—	—	0.574***	8.71
R^2	0.427		0.381	
F-statistic	45.62***		37.82***	

*Note: All models control for age, gender, and income. *** p < 0.001*

5.5 Moderation Analysis: Testing H3

The outcome of a hierarchical multiple regression analysis is shown in Table 3. The Model 1 showed the direct relationship between eco-label awareness and consumer trust (H1) by age, gender, and income. Eco-label awareness became a prominent, positive predictor of consumer trust ($\beta = 0.612$, $t = 9.83$, $p < 0.001$), and the model accounted 42.7% of consumer trust ($R\ 2 = 0.427$, $F(4, 245) = 45.62$, $p < 0.001$). H1 is thus fully supported. Model 2 involved direct test (H2) to test the direct effect of consumer trust on purchase intention controlling demographics. There was a positive significant predictor such as consumer trust (1) = 0.574, $t = 8.71$, $p < 0.001$) where the R2 = 0.381 ($F(4, 245) = 37.82$, $p < 0.001$). H2 is thus fully supported.

Table 4: Moderated Regression Analysis (DV: Consumer Trust)

Predictor	β (Step 1)	β (Step 2)	t (Step 2)	ΔR²
Eco-Label Awareness (ELA)	0.612***	0.598***	9.61	
Perceived Greenwashing (PGW)	−0.341***	−0.328***	−5.74	
ELA × PGW (Interaction)	—	−0.187***	−3.42	0.038
Total R^2	0.464	0.502		

*Note: Variables are mean-centered. *** p < 0.001*

Practically, simple slope analysis showed that the effect of eco-label awareness on consumer trust is both strong and positive when the perception of greenwashing is low (one standard deviation below the mean) (simple slope = 0.791, $p < 0.001$). On the other hand, in the case of greenwashing perception being high (one standard deviation above the mean), the effect becomes much diminished, but nevertheless has a significant but non-significant positive impact (simple slope = 0.218, $p < 0.05$). This trend proves that eco-label effects, although not completely nullified by greenwashing, are severely undercut by it-a conclusion with far reaching brand and regulatory implications.

5.6. Assessment of Structural Model.

The proposed paths between the constructs of the study were tested using the structural model assessment. It looked into the direct influence of the eco-label awareness on consumer trust, the direct influence of consumer trust on purchase intention and the moderating influence of the perception of greenwashing on subjugation among eco-label awareness and consumer trust. The findings showed that the structural relationships were significant and of the anticipated direction. Therefore, the model validated that the awareness of eco-labels enhances trust, and trust enhances the purchase intention, and perceived greenwashing weakens the relationship between the awareness and trust.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
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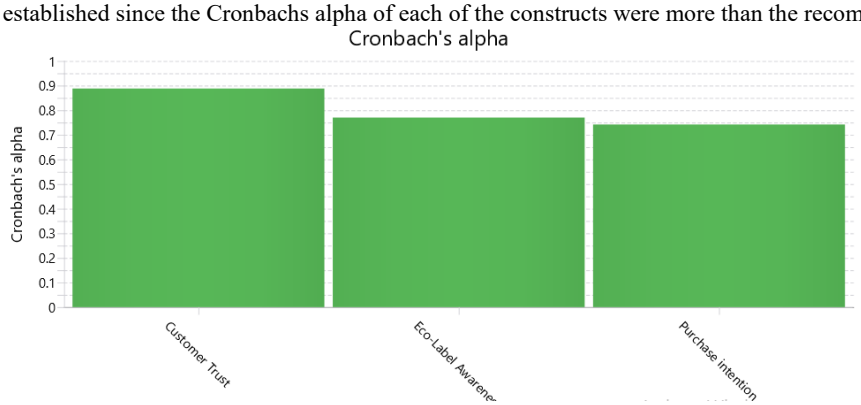
Vol. 36 Issue 1, 2026, Pages: 3928-3935

5.6.1. Outer model assessment

Outer model validation was conducted to test the reliability and validity of the constructs used in the study that is the eco-label awareness, customer trust and purchase intention. The findings indicated that the measurement model was decent and statistically healthy. Internal consistency reliability was established since the Cronbachs alpha of each of the constructs were more than the recommended 0.70.

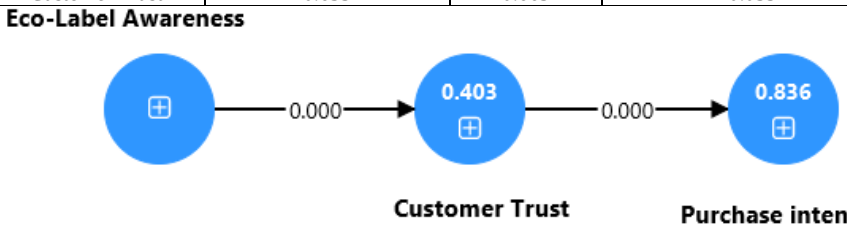


Convergent validity was also determined because the means of the values of Average Variance Extraction were 0.837, 0.735, 0.826, and 0.674, which were greater than the required value of 0.50. The fact that these indicators were able to explain an adequate amount of the variance of their respective constructs implies that these indicators were able to explain a significant amount of the variance of a construct. Moreover, the criterion of assessing discriminant validity was the HTMT criterion, in which the values received were compared with the recommended cut off level of 0.85 or 0.90. On the whole, the outer model analysis revealed that the measurement items were effective and suitable in order to analyse the relationships between the variables of the study.

5.6.2. Inner model assessment

PATH COEFFICIENTS: Mean, STDEV, T values, p values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Customer Trust -> Purchase intention	0.914	0.919	0.016	55.784	0.000
Eco-Label Awareness -> Customer Trust	0.635	0.665	0.055	11.525	0.000



To test the targeted relationship between the eco-label awareness and the customer trust and purchase intention, the structural model assessment was conducted. The results indicated a strong positive impact of eco-label awareness on customer trust (B=0.635, t=11.525, p=5. This implies that the more the eco-labelling awareness, the more customer trust. It was also found that the customer trust significantly affected purchase intention positively (β= + 0.914, t= 55.784, p=0.001). It means that the stronger the customer trust, the higher the purchase intention. On the whole, the outcome of the structural model proved that the relationships between the hypothesised relationships were statistically significant at the expected direction. Thus, the model suggests definite data that customer trust increases as a result of eco-label awareness, which, in its turn, raises the purchase intention.

Goodness of Fit (GoF)

Fit Index	Saturated Model	Estimated Model
SRMR	0.193	0.194
d_ULS	33.224	33.318
d_G	11.276	11.275
Chi-square	324.981	313.914
NFI	0.943	0.949

SRMR, d ULS, d G, Chi-square, and NFI were used to investigate the fit statistics of the model. The approximated model had SRMR of 0.194 and a NFI of 0.949. Although the NFI value is greater than the generally accepted value of 0.90, the SRMR value is significantly higher than the recommended value of 0.08 which indicates that the model is not able to show a great overall fit. Besides, d ULS and d G statistics cannot be meaningfully determined by their crude values and must be assessed by bootstrap confidence intervals. Therefore, it is observed that the model fit results support fit partially and the high SRMR value implies the overall model fit is to be handled carefully.

6. Discussion

The results of this paper provide a number of research-implications of theoretical and practical importance. The affirmation of H1, which claims that the awareness of eco-labels has a positive predictive value on consumer trust, repeats and builds on the results of Thoegersen et al. (2010), Janssen and Hamm (2012), and Hameed and Waris (2018). The effect size (= 0.612) aligns with the higher portion of effects of eco-labels as indicated by meta-analytic reviews of eco-label effectiveness, which indicates that in our sample of eco-label-conscious individuals, eco-labels are already doing as well as they could theoretically. The observation supports the business rationale of investing in credible environmental third party certification as a brand-building strategy.

The evidence in favor of H2 which states that consumer trust is a positive predictor of purchase intention conforms to Trust-Purchase Intention pathway pioneered by Chen (2010) and later reproduced in many settings. The mediation of trust between the eco-label awareness and the purchase intention emphasizes that the eco-label does not directly translate the awareness to sales but rather it does this through the establishment of the psychological base of trust. It bears significant consequences on the manner in which the worth of eco-label certification should be

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Vol. 36 Issue 1, 2026, Pages: 3928-3935

quantified and provided: the measurements that center on awareness or recall overlook the trust-mediation process which upsets commercial results.

The strongest theoretically new one is the support of H3: the negative mediation of the perception of greenwashing on the eco-label-trust relationship. The discovery contributes to the existing literature in various aspects. First, it shows that greenwashing consciousness, even without specially targeted brand-level misleadings, induces a condition of generalized market cynicism that skewices the illustrious indications of authentic eco-labels. This spillover effect of greenwashing at the market level resembles the so-called lemon market dynamic developed by Akerlof (1970): the availability of bad, misleading products in a market negatively impacts consumer trust towards all of the market participants, including good ones. Second, according to the finding, the sustainable brands are being quite productively punished in case of misconduct of competitors, which indicates a market failure, which has consequences regarding competition policy and regulatory design.

Notably, the moderation effect fails to block all the benefits of eco-labels even with high greenwashing perception. The basic slope analysis indicated that the awareness of eco-labels has a marginally significant positive impact on trust despite the high level of greenwashing perception. This implies that eco-labels that are well-known and highly credible, especially when the institutional support is strong, e.g., with governmental certification agencies, might be somewhat inaccessible to the doubts caused by greenwashing. Brands that invest in the most demanding and widely known certifications may in such a way accomplish a competitive distinction with competitors who are not certified as well as those with less credible brands.

Our sample has a high mean score of the perceived greenwashing (M = 3.84) which is in itself a startling result. The skepticism towards greenwashing is not a fringe case of the greenwashing awareness consumer segment that is arguably the most valuable to sustainably oriented brands. This is similar to the results of Schmuck et al. (2018) and Kumar (2016), and implies that the community of sustainable marketing is experiencing a crisis of credibility that extends beyond the brand-level information. Systemic reactions such as the enforcement of regulations, self-regulation by the industry, and consumer education would be necessary to rebuild the consumer credibility on green claims at the market level. These findings also point to the fact that the effectiveness of eco-labels does not only relate to the existence of a label, but also the broader credibility of the green marketplace. Even the real sustainability signals might lose some of their persuasive power when the consumers are shown the misleading statements on the environment on a repeated basis. Hence, the results point out that the enhancement of consumer trust lies not merely in the task of a brand, but a larger institutional and regulatory problem. By doing so, the research helps to add to the increasing opinion that sustainable consumption is defined by personal perceptions and by the integrity of the market environment in general.

7. Implications

7.1 Managerial Implications

The findings can be an affirmation and a caution to the brand managers and sustainable marketing practitioners alike. The high positive influence of the eco-label awareness on the trust and purchase intention confirms the commercial rationality of the idea that the investment in the credible third-party certification is justified and communicating the eco-label status in consumer-facing touchpoints is a strategic decision. Nonetheless, the greenwashing moderating effect ought to have managers look beyond the certifications they have and consider the context of the market. The brands that have a high perceived greenwashing in their product categories, i.e. fashion, personal care and energy, should also take active measures to distinguish their certifications by taking greater measures in transparency like by providing accessible supply chain disclosures, QR-code linked verification systems, and real-time reporting of their environmental impact.

Authenticity rather than aspiration should be considered in the green branding strategy. The similarity in response to the greenwashing literature, and supported here, is that consumers react far better to brands that are showing their environmental progress in a credible manner, as opposed to brands that portray an ideal image of green that seems like a hoax. Companies that are publicly recognized as taking responsibility to address environmental impact, but at the same time show believable progress curves, including Patagonia, offer a pattern of positive ESG communications that create long-lasting consumer confidence instead of temporary reputational rewards. By being combined with the product-level eco-labels, ESG reporting can be a potent addition when presented to consumers in accessible and verifiable forms.

7.2 Policy Implications

To regulators, the result that the perception of greenwashing plays a significant moderating role in deciding eco-label effectiveness has significant regulatory implications on enforcement priorities. Lessening the phenomenon of greenwashing is not only a question of consumer protection, but a requirement to make the market of eco-label be effective as a tool of ensuring sustainable consumption. The regulators should focus on implementation measures of ambiguous, unprovable and deceptive green assertions, and they ought to make investments in consumer education campaigns that enable customers to differentiate between legitimate certifications and advertising language. The Green Claims Directive by the European Commission (2023) is a move in the right direction, yet its efficiency will solely rely on the actively enforced actions and increasing consumer literacy.

The harmonization of eco-label standards between product categories and global markets is also an argument. The spreading of overlapping inconsistent certification schemes, as Hahnel et al. (2015) refer to it as eco-label fatigue, adds to the confusion among consumers and is what allows greenwashing to be escapable. To lessen confusion, enhance credibility of the labels, and the trust-building mechanism that this study has observed, a tiered, nationally or regionally accredated eco-label system, akin to labeling of energy efficiency in the European Union, may be helpful.

7.3 Implications of Consumer Awareness.

The organized environmental literacy programs would be beneficial to the consumers, especially those who are already eco-label conscious, and allow them to be critical about the provenance and rigor of environmental certifications. Having the knowledge of the distinction between self-proclaimed statements and independently verified certifications, such as, would be a type of consumer competence, which would decrease susceptibility to greenwashing, as well as, increase the value of valid eco-labels. There is a role played by non-governmental bodies, consumer organizations, and even educational institutions in the construction of this literacy, which will eventually benefit the welfare of consumers as well as market efficiency in the green economy.

8. Conclusion

The findings can be an affirmation and a caution to the brand managers and sustainable marketing practitioners alike. The high positive influence of the eco-label awareness on the trust and purchase intention confirms the commercial rationality of the idea that the investment in the credible third-party certification is justified and communicating the eco-label status in consumer-facing touchpoints is a strategic decision. Nonetheless, the greenwashing moderating effect ought to have managers look beyond the certifications they have and consider the context of the market. The brands that have a high perceived greenwashing in their product categories, i.e. fashion, personal care and energy, should also take active measures to distinguish their certifications by taking greater measures in transparency like by providing accessible supply chain disclosures, QR-code linked verification systems, and real-time reporting of their environmental impact.

MSW MANAGEMENT -Multidisciplinary, Scientific Work and Management Journal
ISSN: 1053-7899
Vol. 36 Issue 1, 2026, Pages: 3928-3935

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