

Perceived Greenwashing and Its Impact on Brand Trust and Purchase Intention: An Empirical Study of Herbal Shampoo Consumers in Karnataka

Nikheel Bhumanna Shirshyad¹, N. Nagasubba Reddy²

¹MBA 2nd year, RV Institute of Management

²Assistant Professor, RV Institute of Management.

DOI: <https://doi.org/10.51583/IJLTEMAS.2026.150600236>

Received: 09 July 2026; Accepted: 14 July 2026; Published: 01 August 2026

ABSTRACT

The market of herbal and natural shampoo in Karnataka functions within the setting of a rapidly expanding number of eco-labels that make consumers more sensitive to the genuineness of environmental advertising. This paper looks at the perceived greenwashing on brand trust and purchase intention by consumers of herbal shampoo in Karnataka through brand trust. There is a tested moderated mediation model where Environmental Knowledge (EK) is the moderator of the relationship between Perceived Greenwashing (PGW) and Brand Trust (BT), with Brand Trust (BT) being a mediator between Purchase Intention (PI) and Perceived Greenwashing (PGW). A five-point Likert scale structured questionnaire was used to collect the data of 400 respondents and was analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with bootstrapping of 5,000-subsamples by using SmartPLS 4. All four constructs demonstrated satisfactory reliability and validity (Cronbach's α : 0.732–0.799; CR: 0.832–0.868; AVE: 0.555–0.621). Brand Trust had a significant negative effect ($\beta = -0.43$, $p < 0.001$) on Perceived greenwashing, leading to purchase intention ($\beta = +0.43$, $p < 0.001$). Partial mediation was established: the moderating role of brand trust on purchase intention through perceived greenwashing was also significant ($\beta = -0.177$, $p < 0.001$) but there was also direct relationship ($\beta = -0.221$, $p < 0.001$). Environmental Knowledge significantly amplified the negative effect of greenwashing on trust through the interaction term ($\beta = 0.258$, $p < 0.001$). The model accounted 28.9% variation in brand trust, and accounted 29.9% in purchase intention. These results can be applied to herbal FMCG brands and organizations that regulate in the booming green Indian consumer market.

Keywords: Perceived Greenwashing; Brand Trust; Purchase Intention, Environmental Knowledge, PLS-SEM, Karnataka, Herbal Shampoo.

INTRODUCTION

Indian fast-moving consumer goods (FMCG) industry has experienced a drastic increase in the number of products that are being sold as such- herbal, natural, or eco-friendly, especially in personal care segment. The market of herbal shampoo is expected to continue registering at least high percent growth into the late 2020s with some part of it being due to the fact that people want chemical-free products and partly due to efforts made by big brands who have repositioned their old product lines as having green labels. Karnataka is a highly urbanised state with a relatively high level of education in India which makes its consumers an educative artifact to observe the ways in which consumers assess the above claims: consumers in Karnataka are digitally savvy and are in touch with both Indian and imported brands of FMCGs.

This is a market of credibility. Although authentic herbal and organic products are available, much of what is sold as herbal products in India is based on a loose set of terminologies used, including herbal-enriched, natural inspiration, botanical blend etc., which have no regulatory definition and cannot be checked by third parties. This has come to be commonly referred to in the scholarly and regulatory sources as greenwashing, which has made consumers not discern any difference between genuinely green products and the superficially repositioned

products (Delmas and Burbano, 2011; Chen and Chang, 2013). The implication is a loss of the consumer trust that such brands are trying to develop with their eco-marketing.

Several international studies have validated the relationship between perceived greenwashing and consumer trust, however, empirical research on this topic in the Indian context, herbal personal care market, is scarce. Additionally, previous research seldom factors in the buffering nature of Environmental Knowledge - the consumer capacity to read labels, find certifications and assess eco-claims - in determining the strength at which greenwashing perception hurts trust. The same group of knowledgeable consumers can also be more susceptible to greenwashing cues because they possess the mental means to understand when marketing statements and ingredient facts are in conflict.

These gaps have been chosen in this research by aiming the moderated mediation model where the perceived greenwashing is negatively correlated with the brand trust, brand trust correlates with the purchase intention, and Environmental Knowledge mediates the mediating relationship between the PGW and the BT. The research adds value to the increasing Indian literature on sustainable consumption and greenwashing, gives effective implementation recommendations to the herbal FMCG brands in operation in the states of Karnataka and presents a PLS-SEM approach template to such studies in developing market settings.

LITERATURE REVIEW

Chen and Chang (2013) conducted a study on "Greenwash and Green Trust: The Mediation Effects of Green Consumer Confusion and Green Perceived Risk". They investigated the mediation effects of green consumer confusion and green perceived risk on the relationship between greenwashing and green trust. They utilized a quantitative, causal research design. Convenience sampling and structured questionnaire were used to collect the data (280 valid responses). Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM) were used to analyse the data. It was found that at the point of consumer perception of greenwashing, trust in the product and the environmental claims of the brand suffers greatly; in addition to the direct decrease in trust, greenwashing has a compounding effect on the mistrust of consumers by increasing their confusion and sense of risk.

Wang, Pramuja et al (2025). researchers carried out a research on the same title Perceived Greenwashing and Consumer Responses in Hospitality: A Cross-National Study of Taiwan and Indonesia. They examined how perceived greenwashing influenced customer satisfaction and booking intention in the mediating role of trust and authenticity. They employed a cross-sectional quantitative research design. Purposive sampling and a questionnaire by mean of structured questionnaire have been used to collect the data and were collected through 890 respondents (428 Taiwanese people and 462 Indonesian people). Data analysis was done with the help of SmartPLS 4 and PLS-SEM. The results indicated that perceived greenwashing has a great negative impact on trust and authenticity in a hotel, decreasing customer satisfaction and booking intention, with significant differences between Taiwanese and Indonesian consumers.

Di Pillo, Palombi and Strazzullo (2025) encourage research on the topic of the article: Does Greenwashing Wash Away Gen Z Green Purchase Intention? They explored the effect of perceived greenwashing on the purchase intention of the Generation Z in the Theory of Planned Behaviour. They employed a qualitative research design with explanation. Structured online questionnaire and convenience sampling were used to sample 400 Generation Z consumers in Rome. SmartPLS 4 and PLS-SEM were used to analyse the data. The analysis showed that although subjective norms and environmental attitudes have a positive impact on purchase intention, the impact of perceived greenwashing is the strongest, e.g. the perceived greenwashing is highly negative and it undermines the intentions to buy the product in a sustainable way significantly.

Huang et al. (2025) organized a study on the following: The role of green self-identity in determining consumer loyalty and repurchase intentions: a moderated mediation model in green marketing. They investigated the mediation effect of green brand image on consumer loyalty and how green self-identity strengthens sustained customer commitment. They used a structured survey with a 7-point Likert scale among 598 guests who stayed at eco certified hotels. The data were analysed using Structural Equation Modelling (SEM). The findings

revealed that green self-identity significantly strengthens consumer loyalty and repurchase intention, green self-identity moderates the effect of green marketing on brand image and loyalty.

Sun and Shi (2022) carried out research that deals with the topic of "Impact of Greenwashing Perception on Consumers Green Purchasing Intentions. They examined the variables of perceived betrayal as mediators and environmental responsibility as moderators. The type of research design they applied was a quantitative survey-based research process. Randomly sampled, 204 valid responses were used to collect the data. The SPSS and AMOS (SEM) were employed to analyze the data. The results showed that the perception that consumers have of greenwashing instills in them a feeling of psychological treachery, which make buy intentions decline much more so among the eco-efficient consumers.

Sajid et al. (2025) conducted a study on "Does greenwashing dim green actions? Examining how greenwashing impacts consumers' pro-environmental intentions". They investigated the mediating roles of consumer skepticism, trust erosion, and moral disengagement between greenwashing and pro-environmental intentions. They used an explanatory quantitative research design. The data were collected from sample of 360 consumers using convenience sampling and a structured questionnaire. The data were analyzed using Structural Equation Modeling (SEM). The findings showed that greenwashing significantly weakens pro-environmental intentions, with skepticism and trust erosion mediating this negative effect.

Braga et al. (2019) conducted a study on "Greenwashing Effect, Attitudes, and Beliefs in Green Consumption". They examined the impact of greenwashing perception on consumer attitudes, beliefs and green product consumption behaviour. Their research design was an exploratory quantitative research design. The structured questionnaire was used to gather the data of 880 valid respondents. IBM SPSS Statistics 22 and SmartPLS 2.0 (PLS-SEM) were employed to analyze the data. The results indicated that the presence of positive consumer attitudes confirms the idea of green consumption, but the perception of greenwashing escalates to confusion and risk and undermines the satisfaction, loyalty, and perceived benefit.

A study by Keilmann and Koch (2025) entitled Little green lies: greenwashing has a negative influence on corporate perception was done. They explored the interaction of perceived motives, skepticism, and authenticity on corporate reputation. Their research design was a quantitative experimental design, which employed controlled stimuli. Nineteen-one participants were sampled out of convenience to gather the data. The SPSS, ANOVA and mediation analyzed the data. The results have shown that even minor discrepancies (little green lies) have great negative impact on corporate reputation and credibility and as the difference in the discrepancy increases, the negative impact resulting is also significant.

Zhang et al. (2018) carried out a research on the topic of "The influence of greenwashing perception on green purchasing intentions". Their study involved the mediating effect of green word-of-mouth, and moderating effect of green concern. They employed an explanatory quantitative research design. Convenience sampling was used to gather the data on 553 customers. Structural Equation Modeling (SEM), mediation, and moderation analysis were used to analyse the data. The results revealed that the perception of greenwashing decreases the green purchase intention both directly and indirectly, through green word-of-mouth and that the green concern enhances the negative response.

sayibu Ibrahim Nnindini et al. (2024) studied the article on describing brown as green: an exploration of the connection between greenwashing and consumer negative emotive effects. They analyzed how greenwashing and its effects, such as brand avoidance, hate and retaliation are connected. They used an explanatory quantitative research design. The survey was taken of 490 respondents through the internet. SmartPLS 3.3 (PLS-SEM) was used to analyse the data. The results were that greenwashing is associated with high negative emotional responses, including avoidance and negative word-of-mouth, which brand loyalty mitigates to some extent.³

Research Gap

The literature analyzed above presented a well-developed background to the personal relationship suggested in the model of the research presented in this paper. However there are still a few gaps. Firstly, the current research on greenwashing and trust is primarily based on consumers in the Western market or on generalized green

product types; the Indian herbal personal care market or consumer has not received much empirical research despite its market importance and regulatory uncertainty. Second, although mediation of trust between the perception of greenwashing and purchase intention is theoretically based, this mediation relationship has seldom been empirically tested with PLS-SEM using bootstrapping confidence interval in an Indian market. Third, the Environmental Knowledge is also suggested as the moderating factor between the relationships of the variables of PGW and BT but is not empirically tested within a contextually applicable product category such as herbal shampoos in Karnataka. All the three gaps are filled in the current research under a single empirical framework.

Objectives

- To test on whether perceived greenwashing significantly erodes brand trust among consumers of herbal shampoo in Karnataka.
- To determine whether brand trust is a significant and a positive contributor to purchase intention.
- To test the mediation of brand trust in the PGW → PI relationship.
- To analyse whether Environmental Knowledge does indeed moderate the relation between the PGW and BT such that it enhances the negative relation of lower-knowledge level consumers.

Hypotheses

On the background of the theoretical framework and literature review, the hypotheses are

H1: There is a significant negative effect of perceived greenwashing on brand trust among the consumers of herbal shampoo in Karnataka.

H2: Brand trust has a significant positive impact on purchase intention.

H3: Perceived greenwashing has a significant direct negative impact on purchase intention.

H4: Brand trust mediates the relationship between perceived greenwashing and the purchase intention (indirect effect).

H5: Environmental Knowledge moderates the relationship between the PGW and the BT so that increasing EK will enhance the negative impact of greenwashing on trust.

RESEARCH METHODOLOGY

Research Design

A quantitative cross-sectional survey design was taken up. This methodology is in line with known practice in PLS-SEM-based consumer behaviour research, and suitable to examine a theorized structural model that includes multiple latent constructs at a single point in time.

Sample size and sampling design.

The convenience sampling technique was used to gather the responses of the herbal shampoo consumers. Convenience sampling is commonly used in exploratory, PLS-SEM studies whose main goal is not population-level inference, but model validation. The original dataset consisted of 400 valid responses that exceeds the minimum PLS-SEM models require four constructs and up to four arrows into one construct (Hair et al., 2019).

Sampling Unit

The sampling unit is of adult residents of Karnataka, 18 years and more who said they frequent bought herbal or natural shampoo brands. The respondents were requested to base their answers to be referring to a particular brand of herbal shampoo, which they used most often so that construct measures were based on true brand experience and not on perceptions of herbal shampoo in general.

Data Collection

The primary data was gathered via a structured questionnaire, via the online system Google Forms in March 2026. The questionnaire consisted of various parts: Section A was used to screen the herbal shampoo users. The latent constructs were assessed on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) in section B. The items measured Environmental Knowledge (4), Perceived Greenwashing (4), Brand Trust (4), and Purchase Intention (4) and included a total of 16 Likert items. Demographic data (gender, age group, education, monthly income and occupation) was captured in section C. All items were forward-coded; there was no backward coding. The secondary data was used from the journals indexed on Scopus and google scholar.

Measures

Environmental Knowledge (EK) measures the consumers awareness about labelling, ingredients present and understanding between organic and herbal certifications such as ECOCERT and COSMOS along with identifying harmful chemicals. The Perceived Greenwashing (PGW) were basically formed based on Braga et al. (2019) and Chen Chang (2013) to assess the vagueness in the eco-terms, masking of chemicals and herbal claims, exaggerating the visuals of naturalness and misinterpretation. Brand Trust (BT) items also indicated perceived truthfulness of claims, safety promise reliability, health safety and non-deception. The Purchase Intention (PI) items were modified to reflect continuation of purchase, brand preference and intends to repurchase.

Statistical Tools

Data were analysed using SmartPLS 4. PLS-SEM was chosen instead of covariance-based SEM since it is quite suitable in exploratory predictive modelling (Hair et al., 2012, 2019). Path coefficient significance and confidence intervals were obtained by bootstrapping with 5,000 subsamples and a two tailed test of 0.05. Measurement model was evaluated in terms of reliability (Cronbach α , composite reliability ρ_c , ρ_a) and validity (AVES, HTMT) and structural model was then tested.

Technique	Purpose
PLS-SEM (SmartPLS 4)	Measurement and structural model estimation
Bootstrapping (5,000 subsamples)	Path significance, CIs, t-statistics (H1–H5)
Cronbach's α / CR / ρ_a	Internal consistency and reliability
AVE / HTMT / Fornell-Larcker	Convergent and discriminant validity
SRMR / NFI	Overall model fit

Table 1: Statistical Techniques Employed

Data Analysis and Results

Demographic Profile of Respondents

The demographic and usage profile of the 400 respondents is in Table 2. Most of the respondents were female (57%) who are in line with higher consumption of personal care products reported by women in Indian FMCG surveys. 41% of the respondents were in the 18-25 (Gen Z) age group, then 26-35 (28.75%), implying that this is a highly youthful sample of consumers that will be well poised to assess herbal brand statements on digital platforms. Graduates were 46% of the respondents and post-graduates or professionally qualified respondents were 34.75%. The income was predominantly distributed 43% of the 25000-50000 range. The most anchored brand was Himalaya Herbals 14.75% as it has been leading in the market share of Karnataka market in herbal shampoo category, followed by Patanjali Kesh Kanti (10.5%). Surprisingly, a considerable percentage of the

sample 62% chose Others which implies a fragmented and heterogeneous competitive environment in the herbal hair care sector.

Variable	Category	Frequency	Percentage (%)
Gender	Female	228	57.0
	Male	159	39.75
	Prefer not to say	13	3.25
Age Group	18–25 (Gen Z)	164	41
	26–35 (Millennials)	115	28.75
	36–50	72	18
	Above 50	49	12.25
Education	Graduate	184	46.0
	Post-Graduate / Professional	139	34.75
	Up to 12th / Diploma	77	19.25
Monthly Income	₹25,000–50,000	172	43
	₹50,001–1,00,000	80	20
	Above ₹1,00,000	84	21
	Below ₹25,000	64	16.0
Primary Brand	Himalaya Herbals	59	14.75
	Patanjali Kesh Kanti	42	10.5
	Biotique	20	5.0
	Indulekha	31	7.75
	Others	248	62

Table 2: Demographic Profile of Respondents (n = 400)

Descriptive Statistics

Descriptive statistics both at the item and construct levels are indicated in Table 3. Brand Trust items presented the largest means scores (BT1 = 4.42 to BT4 = 4.35) indicating that the respondents had an extremely high level of foundation trust towards their anchor brand. The mean of BT1 (I trust this brand) is high and indicates general trust which is deeply rooted, but a large negative skewness (up to -1.01) means that there is a ceiling effect and the greatest number of respondents are strongly positive. Means of perceived Greenwashing item 3.45 (PG4) to 3.51 (PG1) which allows concluding that potential customers have a more or less perception of deceptive environmental statements, disregarding their personal attitude to the brand. The Environmental Knowledge items concentrated on 3.13-3.19 with a moderate level of environmental literacy with the largest standard deviation (EK2 = 1.08) suggesting that there is more diversity in the actual environmental literacy level of the respondents.

On the other hand, the lowest mean scores were seen in Purchase Intention items (PI2 = 2.00 to PI4 = 2.06) which suggest a strong resistance to purchase that is markedly different on high brand trust scores (construct mean $\approx$ 4.38) but equally contrasting on purchase intention scores (construct mean $\approx$ 2.03). Though the respondents claim high levels of overall trust towards their anchor brand, the structural model shows that moderate levels of greenwashing perception (PGW mean $\approx$ 3.49) can help block purchase intention directly as well as by causing partial erosion of the trust. The low PI scores probably indicate that brand trust remains, but is currently being aggressively undermined by perceived misleading eco-communicated claims - a tendency that is consistent with the partial mediation result in H4.

Item	Construct	Mean	SD	Min	Max	Skew
EK1	Env. Knowledge	3.130	0.944	1	5	-0.208
EK2	Env. Knowledge	3.155	1.083	1	5	-0.157
EK3	Env. Knowledge	3.138	0.928	1	5	-0.163
EK4	Env. Knowledge	3.198	1.059	1	5	-0.083
PG1	Perc. Greenwashing	3.518	0.876	1	5	-0.087
PG2	Perc. Greenwashing	3.505	0.963	1	5	-0.124
PG3	Perc. Greenwashing	3.512	0.898	1	5	-0.111
PG4	Perc. Greenwashing	3.452	0.980	1	5	-0.188
BT1	Brand Trust	4.420	0.678	1	5	-0.847
BT2	Brand Trust	4.358	0.708	1	5	-0.807
BT3	Brand Trust	4.405	0.694	1	5	-1.011
BT4	Brand Trust	4.352	0.731	1	5	-0.967
PI1	Purchase Intention	2.058	0.772	1	5	0.230
PI2	Purchase Intention	2.007	0.803	1	5	0.396
PI3	Purchase Intention	2.007	0.777	1	5	0.373
PI4	Purchase Intention	2.068	0.845	1	5	0.372

Table 3: Item-Level Descriptive Statistics (n = 400)

Measurement Model

Indicator reliability, internal consistency reliability, convergent and discriminant validity were evaluated on the measurement model by the procedure suggested by Hair et al. (2019).

Almost all the outer loadings were more than or were very close to the suggested value of 0.70 (Hair et al., 2019). For Brand Trust, loadings ranged from 0.699 (BT4) to 0.785 (BT2); for Perceived Greenwashing, from 0.740 (PG4) to 0.819 (PG1); for Purchase Intention, from 0.696 (PI4) to 0.807 (PI1). In the case of Environmental Knowledge, loadings were between 0.619 (EK4) and 0.869 (EK2). Three indicators (BT4, 0.699; PI4, 0.696; and EK4, 0.619), were below a 0.70 threshold, but three below the threshold significantly (BP 0.619). EK4, measuring knowledge on eco-certifications (e.g. ECOCERT and COSMOS) could be streamlining a slightly different aspect

of environmental knowledge than EK1-EK3, which focus on label-reading and chemical identification. They were all kept since construct-level reliability and AVE of each specific construct were acceptable (Hair et al., 2019), but future research can potentially contemplate substituting EK4 with an item that is more consistent with the label-reading domain.

Table 4 shows the reliability and validity of each construct. The Cronbach's alpha values were between 0.732 and 0.799 all above the suggested cut off 0.70. The values of composite reliability (ρ_c), were between 0.832 and 0.868, whereas (ρ_a) values were between 0.741 and 0.912, all acceptable. The values of Average Variance Extracted (AVE) were between 0.555 and 0.621, which is more than 0.50 (Fornell and Larcker, 1981) verifying convergent validity.

Construct	Item	Cronbach's α	ρ_a	CR (ρ_c)	AVE	Factor loadings
Env. Knowledge	EK1	0.799	0.912	0.848	0.587	0.719
	EK2					0.869
	EK3					0.831
	EK4					0.619
Perc. Greenwashing	PG1	0.797	0.804	0.868	0.621	0.819
	PG2					0.796
	PG3					0.796
	PG4					0.740
Brand Trust	BT1	0.743	0.750	0.838	0.563	0.762
	BT2					0.785
	BT3					0.753
	BT4					0.699
Purchase Intention	PI1	0.732	0.741	0.832	0.555	0.807
	PI2					0.711
	PI3					0.760
	PI4					0.696

Table 4: Construct Reliability and Validity (n = 400)

Note: Where α = Cronbach alpha; ρ_a = Dijkstra-Henselers ρ_a , CR = composite reliability (ρ_c) and AVE = average variance extracted. Thresholds: $\alpha \geq 0.70$, $CR \geq 0.70$, $AVE \geq 0.50$ (Hair et al., 2019). Indicators that achieved middle-level loading of slightly less than 0.70 (BT4 = 0.699, PI4 = 0.696, EK4 = 0.619) were maintained to meet construct-level reliability and AVE standards. This high ρ_a of Environmental Knowledge (0.912) in comparison with its Cronbach's alpha (0.799) and CR (0.848) is due to the fact that, the much higher loading of EK2 (0.869) versus EK4 (0.619), causes the weight difference to inflate ρ_a so high above the α -CR interval. This does not nullify the construct in the sense that both α and CR exceed thresholds.

Both Heterotrait-Monotrait (HTMT) ratio and Fornell-Larcker criterion were used to test the discriminant validity. The Fornell Larcker criterion matrix in Table 5 shows that the diagonal values ($\sqrt{\text{AVE}}$) are greater than all the off-diagonal inter-construct values. The largest off-diagonal correlation was obtained between BT and PI ($r = 0.509$), which is much lower than the $\sqrt{\text{AVE}}$ of BT (0.750), which validates the discriminant validity. Table 6 shows the HTMT matrix: all of the ratios were lower than the conservative value of 0.85 (Kline, 2016), the biggest ratio was HTMT (BT, PI) = 0.679. The inner model did not present any multicollinearity issues and had a VIF value of 1.00 to 1.23.

Construct	BT	EK	PG	PI
BT	0.750			
EK	-0.182	0.766		
PG	-0.431	-0.048	0.788	
PI	0.509	-0.020	-0.399	0.745

Table 5: Fornell-Larcker Criterion (Diagonal = $\sqrt{\text{AVE}}$; Off-Diagonal = Inter-Construct Correlations)

Note: Bold diagonal values represent $\sqrt{\text{AVE}}$. Discriminant validity requires diagonal > all off-diagonal values in the corresponding row and column.

Construct	BT	EK	PG	PI
BT				
EK	0.185			
PG	0.550	0.140		
PI	0.679	0.095	0.519	

Table 6: HTMT Discriminant Validity Matrix

Note: All HTMT values < 0.85, confirming discriminant validity (Kline, 2016; Hair et al., 2019).

Structural Model and Hypothesis testing.

Path coefficients, t-statistics, p-values and bootstrapped 95% confidence intervals were used to evaluate the structural model. The inner model only contained insignificant collinearity between variables as all the VIFs were found to be lower than 1.25. The SRMR (0.071, acceptable according to Henseler et al., 2015) and NFI (0.774) were used to evaluate model fit (although it should be emphasized that NFI is a known attribute of NFI in PLS-SEM it is sensitive to the complexity of the model and level of sample size - so with the addition of an interaction term, NFI underestimates model The primary fit index, in this case, should be the SRMR (0.071)50, which is within the acceptable range. Brand Trust and Purchase Intention had moderately accurate $R^2 = 0.289$ (adjusted 0.284) and $R^2 = 0.299$ (adjusted 0.295), respectively, as explained by the model (both of which are in the moderately accurate exploratory PLS-SEM models) (Hair et al., 2019).

Hypothesis Testing Summary

In addition, one significant negative direct relationship was found between Environmental Knowledge and Brand Trust (EK $\rightarrow$ BT: 0 -210, $t = 5.091$, $p = 0.001$) also, suggesting that customers with higher levels of knowledge acquire less brand trust, not mentioning the moderated pathway. H1 is accepted: perceived greenwashing has a significant negative impact on brand trust ($\beta = -0.428$, $t = 11.494$, $p < 0.001$, CI does not include zero). H2 is

accepted: brand trust is a significant and positive predictor of purchase intention ($\beta = +0.414$, $t = 10.061$, $p < 0.001$). H3 is confirmed: the direct relationship (between perceived greenwashing and purchase intention) is statistically significant ($\beta = -0.221$, $t = 4.568$, $p < 0.001$), which means that the effect of perceived greenwashing on the purchase intent is both direct and indirect. H4 is supported: the indirect effect PGW→BT→PI is significant ($\beta = -0.177$, $p < 0.001$), with a bootstrapped 95% CI of $[-0.228, -0.133]$ that fully excludes zero. But since the direct path (H3) is also noteworthy the mediation is only partial and not complete: brand trust moderates the association between perceived greenwashing and purchase intention only partially. H5 is upheld: the interaction term EK x PGW is a strong predictor of BT ($\beta = -0.258$, $t = 5.191$, $p < 0.001$) which supports the strong amplifying effect of Environmental Knowledge in greenwashing on trust.

Hypothesis	Path coefficient β	T statistic	Bootstrap 95%	Validity
H1	-0.428*	11.494	(-0.499, -0.351)	Supported
H2	+0.414*	10.061	(+0.333, +0.494)	Supported
H3	-0.221*	4.568	(-0.314, -0.126)	Supported
H4	-0.177*	7.348	(-0.228, -0.133)	Supported
H5	-0.258*	5.191	(-0.346, -0.161)	Supported

Table 7: Hypothesis Testing Summary

* $p < 0.001$.

DISCUSSION OF FINDINGS

The results of this paper are in line with and complement the emerging empirical evidence of greenwashing, brand trust, and purchase intention in sustainability marketing. The most notable finding is the support of the partial mediation (H4): perceived greenwashing has the significant direct negative impact on purchase intention (H3 supported, $\beta = -0.221$, $p < 0.001$) and indirect negative impact through brand trust (-0.177 , $p < 0.001$). The trend implies that Karnataka consumers undermine their purchase intention by using two channels: on the one hand, greenwashing, as a perception, undermines brand trust, which, in turn, has a negative impact on purchase intention; on the other hand, greenwashing has a direct attitudinal recoil that does not require brand trust. There is a theoretical implication on this: it deduces that the point of commercial abuse of a brand, through greenwashing, is not confined to trust-mediating processes, but directly at the point of perception. It is an extension of the results of Chen and Chang (2013) who found that the relationships between greenwashing and trust work through confusion and perceived risk, since it demonstrates that an attitudinal-based relationship is also direct as well as mediated by trust.

The negative impact of PGW on BT (H1 supported, $\beta = -0.428$) and the positive impact of BT on PI (H2 supported, 0.414) are as expected by Di Pillo et al. (2025) who reported a positive validation of greenwashing as the most negative predictor of green purchase intention in their sample, which consisted of Italian Gen Z participants. Notably, the attained results indicate partial, but not full, mediation: although brand trust mediates a considerable amount of the PGW→PI connection (indirect effect $1 = -0.177$), a strong direct impact of the predictor (PGW) on the outcome (PI) remains ($1 = -0.221$, H3 accepted). It implies that, in the market of herbal shampoos in Karnataka, there is an erosion of purchase intention by perceived greenwashing by reducing brand trust, and having a direct attitudinal recoil independent of brand trust. The immediate emotional or moral reaction with regard to perceived deception that involves no cognitive mediator of trust reassessment may be quantified in the direct effect.

The outcome of the moderation (H5 supported, $\beta = -0.258$, p less than 0.001) is not only statistically sound, but also theoretically important. Brand trust is affected to a significantly greater extent when perceived as greenwashed by consumers with greater Environmental Knowledge, i.e. those who can read labels, are

knowledgeable of certifications and identify particular harmful chemicals. The size of the effect ($f^2 = 0.088$, small-to-medium) has the practical meaning. This conclusion is in contrast to threads of the environmental psychology literature which locate knowledge as a protective or buffering force. In the Karnataka herbal shampoo setting, Environmental Knowledge is more of an amplifier than a buffer: the knowledge will enable the consumers to identify greenwashing with accuracy, transforming analogous suspicions into sweeter than honey credibility penalties. It aligns with Sajid et al. (2025) and Keilmann and Koch (2025), who established that increased consumer knowledge of sustainability claims amplified the scepticism and the penalty of trust, but not buffering.

Another structural route, which should be considered, is the substantial negative direct impact of Environmental Knowledge on Brand Trust (EK $\rightarrow$ BT: $\beta = -0.210$, $p < 0.001$). This paradoxical result implies a rather unexpected conclusion that consumers, who are more environmentally literate, in fact, show lesser trust to herbal shampoo brands regardless of the interaction of greenwashing. One of these is that the better-informed consumer has a more skeptical evaluation filter on brand claims, becoming aware of the disconnect between what is marketed as herbal based on the credentials and the actual composition of the ingredients. This is in line with the trend in publications by Sajid et al. (2025), in which increased awareness to sustainability matters created more scepticism instead of lessening them. The implication of this finding is on the ways that brands interact with environmentally literate consumers: one should consider greater not less importance of transparency and third-party verification with an increase in consumer knowledge.

The R^2 is rather small 0.289 and 0.299 of BT and PI, respectively, which is characteristic of the exploratory sustainability research models that are based on PLS-SEM (Hair et al., 2019). The concept of brand trust in herbal FMCG setting is dependent on numerous factors in addition to greenwashing perception such as brand heritage, access to offline advisor, family usage patterns, and actual experience with ingredients, and these values mirror that fact without overshadowing the importance of the individual pathways investigated. The SRMR of 0.071 is within the acceptable range defined by Henseler et al. (2015); the NFI of 0.774 is not as high as the conventional 0.90 value and is considered a limitation of the given model setup, which can be probably explained by the introduction of the interaction term that complicates the model.

CONCLUSION

This research aimed at the testing of a moderated mediation model in the greenwashing perception, brand trust and purchase intention in the herbal shampoo market in Karnataka. The findings not only confirm the validity of the two-pathway operation of perceived greenwashing on purchase intention but also, partial mediation is affirmed, where a significant immediate impact exists on purchase-based decision-making ($\beta = -0.221$) in addition to significant indirectly mediated by brand trust (-0.177). Environmental Knowledge augments the trust erosion effect, so not everybody consumer education defends the brand against greenwash ripple: rather, it elevates the analytically subtly consumer group that quantifies the suggested perceived flamm, not just by collapsing trust, as well as by simply and autonomously withdrawing purchase intention.

They possess implications in practice to the herbal FMCG brands, policymakers and even educators. To brands, the message is clear, greenwashing is not a grey area in marketing and as such it has a systemic ability to kill the trust upon which future purchase behaviour rides upon. Brands which invest in an authentic certification (ECOCERT, India Organic, COSMOS) labelling of ingredients, verifiable sustainability statements will create the credibility they will need to maintain purchase intention, especially in the same segment of environmentally-conscious Karnataka consumers which are increasing. Brands that are based on imprecise botanical imagery or false claims about naturalness increasingly risk losing credibility due to enhanced knowledge among the consumer.

To the policy makers and the regulators, the results confirm the need to introduce more definitional guidelines on what is meant by herbal claims, natural claims and organic claims on personal care products. There is the informational asymmetry that makes greenwashing more possible and harmful because of the current regulatory environment that mostly does not define these terms in the FMCG context. With a tiered certification system like the frameworks that have been in operation in the European Union under the EU Green Claims Directive,

the uncertainty that has allowed shallow greenwashing would be minimized, and the genuinely differentiated herbal brands would be rewarded.

To educators and institutions, the increase of greenwashing sensitivity due to Environmental Knowledge implies that sustainability literacy programmes, i.e., those programs that train to read labels, certification awareness and abilities of the consumer, to scrutinize eco-claims, are highly likely to create a more enlightened and more demanding consumer. This will impact the lateral organization of herbal FMCG markets in India as Gen Z and millennial consumer, more likely to have received formal environmental education, achieve a greater share in the market.

Theoretical Contributions

This research contributes in three ways to the current body of research on greenwashing, brand trust and sustainability marketing in Indian context.

To begin with, it determines the partially mediated role of brand trust in the PGW to PI relationship in the herbal personal care market in India. Although in certain international situations full mediation was identified, the current result of partial mediation explains the process: the loss of purchase intention is caused by greenwashing indirectly (erosion of trust, $\beta = -0.177$) and directly (through attitudinal channel, $\beta = -0.221$) without intermediation of trust. The dual-channel result indicates that greenwashing perception in the context of the Karnataka herbal shampoo market does not only cause a reassessment of cognitive trust but also prompts a direct emotional or moral disgust that in turn inhibits purchases intention in the market but then separately. Theoretical implications of this include the specification of the greenwashing models in the Indian consumer setting and the need to speculate trust-focused interventions to help regain the purchase intention in full measure after the greenwashing is detected.

Second, it statistically shows that Environmental Knowledge increases instead of mitigates the negative impact of greenwashing on brand trust ($0.258, p < 0.001, f^2 = 0.088$). This questions a line of the environmental psychology literature, which considers consumer knowledge as a defense against marketing manipulation. Also in the context of the herbal FMCG, consumer knowledge can make consumers more adept at detecting greenwashing, by turning what might be an otherwise diffuse scepticism into a harsh punishment of trust. Such a kind of interaction develops much power to its conclusions because this effect is a contributor to the effect of knowledge amplification in this regard. The suggestion of this subtlety is in how knowledge-building programmes are framed by the brands and on the teachers.

Third, the study also indicates a validated PLS-SEM to explore the topic of greenwashing in the Indian herbal personal care segment. This four-construct reflective and 16-item tool whose statistical measure of reliability and validity is confirmed may be one of the methodological foundations of future studies examining whether addition of other variables such as social media exposure, regulatory awareness or price sensitivity, moderate or mediate the greenwashing-trust-intention relationship.

Managerial Implications

In the case of brand managers and marketing directors in the herbal FMCG industry, the partial mediation result puts the risk of greenwashing squarely in a new context of a reputational nuisance into a multi-channel structural threat. Perceived greenwashing lowers purchase intention not only due to its eroding brand trust, but due to a direct recoil effect i.e., the effect of trust-repair activity on purchase intention cannot alone restore purchase intention following consumer perceptions of deception. Whenever a practice evokes the perception of greenwashing, such as an ambiguous eco-labelling, false certification, or the discrepancy between marketing assertions and product formulations, then the directly and quantitatively costly aspect is the loss of consumer retention. In addition to its brand health tracking, brands ought to hire trust audits periodically, considering both the trust measurements and direct buying intent indications early warning signs.

An implication of the moderation by Environmental Knowledge is quite practical and can be easily ignored: the higher the consumer education, the heavier the penalty against greenwashing. It is to be expected that in

Karnataka, brands with a relatively high educational attainment, will experience a rapidly growing trust penalty on eco-claim vagueness in the next 10 years. No less of an environmental messaging is the strategic response, but to make an investment in justifying it - by third-party accreditation, QR-code-based ingredient disclosure, and consumer initiative round genuine sustainability projects.

The voluntary codes of conduct with minimal evidentiary threshold bases of herbal and natural claims, as well as a distinction of these and certified organic products would provide products who follow the code with credible differentiation platform, and a sense of accountability to products that do not follow the commendation.

Study limitations.

This research has a number of limitations, which must be mentioned together with the results. To begin with, the 400-respondent sample, sufficient in the PLS-SEM methodology, restricts the generalisation of results in terms of the entire heterogeneity of the consumer base of Karnataka (Hair et al., 2019). The consumer literacy, accessibility to the digital world, and familiarity with the brands of the herbal FMCGs have significant urban-rural disparities in Karnataka; overall, a larger stratified sample would benefit the findings.

Second, cross-sectional design will measure the perceptions at a single point in time. Considering the fast rate of regulation evolution of the Indian personal care market and increased consumer dialogues about greenwashing on operating platforms like Instagram and YouTube, the perception of trust and sensitivity towards eco-markets might change significantly within a comparatively limited period. To be able to make a causal inference regarding the effects of greenwashing after the crimes on the trust curves, longitudinal designs that follow the identical respondent panel in a period of 12-24 months would be a viable option.

Following, a potential threat to the validity of the findings is in the self-reported likert scale data, which may lead to common method variance and social desirability bias particularly in the questions that require the respondent to think about what he/she knows and what he/ she thinks the brand is deceiving them about. Respondents can overrate their Environmental Knowledge or inflate the greenwashing imaginations in line with the perceived social expectations. Some observational data triangulation (acquisition of actual label-reading behaviour during making the in-store purchase decisions) would be a more objective measure.

Fourth, the model offers an explanation of 28.9% of variability in brand trust and 29.9% in purchase intention, which left a large part of a variability unexplainable by this model. Price sensitivity, offline advisor networks, family brand loyalty, actual ingredient experience, exposure to influencer content around herbal products are probably other variables that act in conjunction with the constructs explored in this study.

Future Research Directions

This research presents some opportunities to continue the research in the future. The moderated mediation model can be further expanded by further adding some moderators that are especially specific to the Indian market: consumer scepticism, and the impact of the content of social media influencers on herbal brand perceptions. Since the use of social media as a means of herbal products promotion is developing at a high pace in India, exploring the interaction between social media influencer and greenwashing perception would be a fruitful development.

A five-city tier (Tier 1) city (Bangalore), six levels (Tier 2), and a rural Karnataka district (Tier 3) comparative design would examine the hypothesis that the moderated mediation framework is maintained at various levels of institutional access, and digital access. Tier 2 and Tier 3 research is most pressing since with mass herbal FMCG brands like Patanjali and Meera, the maximum portion of market penetration occurs in non-metro regions, where consumers might have lesser access to the institutional cues that define the true meaning of herbal certification and superficial green advertising.

The enduring effects of exposure to greenwashing on recovery of brand trust might also be the focus of a future study. It is proven in the current study that greenwashing destroys trust, but it does not provide the answer as to when and how that trust can be restored after a greenwashing has occurred. Experimental designs intervention

into the character of a corrective response of a brand i.e., transparent apology and corrective reformulation, purchase of third-party certification or further denial would yield directly applicable advice on how to respond to a brand crisis in the herbal FMCG setting.

Lastly, the incorporation of the behavioural data of real purchase transactions and/or loyalty programme data, or e-commerce (Clickstream) data in terms of behaviour-based data would render the relationship between the trust and the intention data in this study to translate into actual behavioural results, which would help researchers to address the aforementioned issue of the attitude-behaviour gap that persistently affects sustainability marketing study.

REFERENCES

1. Mohammed, A., Al-Swidi, A. K., Al-Hakimi, M. A., and Ferraris, A. (2025). From greenwashing to brand avoidance: the roles of perceived risk, trust and negative word-of-mouth. *International Journal of Bank Marketing*, 44(5), 970–996. <https://doi.org/10.1108/IJBM-09-2024-0535>
2. Isac, N., Javed, A., Radulescu, M., Cismasu, I. D. L., Yousaf, Z., and Serbu, R. S. (2024). Is greenwashing impacting on green brand trust and purchase intentions? Mediating role of environmental knowledge. *Environment, Development and Sustainability*, 27(9), 21329–21346. <https://doi.org/10.1007/s10668-023-04352-0>
3. Szabo, S., and Webster, J. (2021). Perceived greenwashing: The effects of green marketing on environmental and product perceptions. *Journal of Business Ethics*, 171(4), 719–739. <https://doi.org/10.1007/s10551-020-04461-0>
4. Tarabieh, S. M. Z. A. (2021). The impact of greenwash practices over green purchase intention: The mediating effects of green confusion, green perceived risk, and green trust. *Management Science Letters*, 11(1), 185–196. <https://doi.org/10.5267/j.msl.2020.8.028>
5. Santos, C., Coelho, A., and Marques, A. (2023). The greenwashing effects on corporate reputation and brand hate, through environmental performance and green perceived risk. *Asia-Pacific Journal of Business Administration*, 16(3), 655–676. <https://doi.org/10.1108/APJBA-05-2022-0216>
6. Zhang, L., Li, D., Cao, C., and Huang, S. (2018). The influence of greenwashing perception on green purchasing intentions: The mediating role of green word-of-mouth and moderating role of green concern. *Journal of Cleaner Production*, 187, 740–750. <https://doi.org/10.1016/j.jclepro.2018.03.201>
7. Sajid, M., Zakkariya, K. A., Suki, N. M., and Islam, J. U. (2024). When going green goes wrong: The effects of greenwashing on brand avoidance and negative word-of-mouth. *Journal of Retailing and Consumer Services*, 78, 103773. <https://doi.org/10.1016/j.jretconser.2024.103773>
8. Braga, S., Martínez, M. P., Correa, C. M., Moura-Leite, R. C., and Da Silva, D. (2019). Greenwashing effect, attitudes, and beliefs in green consumption. *RAUSP Management Journal*, 54(2), 226–241. <https://doi.org/10.1108/RAUSP-08-2018-0070>
9. Wang, H., Ma, B., and Bai, R. (2020). The spillover effect of greenwashing behaviours: An experimental approach. *Marketing Intelligence & Planning*, 38(3), 283–295. <https://doi.org/10.1108/MIP-01-2019-0006>
10. Nyilasy, G., Gangadharbatla, H., and Paladino, A. (2014). Perceived greenwashing: The interactive effects of green advertising and corporate environmental performance on consumer reactions. *Journal of Business Ethics*, 125(4), 693–707. <https://doi.org/10.1007/s10551-013-1944-3>
11. Chen, Y. S., and Chang, C. H. (2013). Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *Journal of Business Ethics*, 114(3), 489–500. <https://doi.org/10.1007/s10551-012-1360-0>
12. Chen, Y. S. (2014). The influence of greenwash on green word-of-mouth: The mediation effects of green perceived quality and green satisfaction. *Quality & Quantity*, 48(5), 2411–2425. <https://doi.org/10.1007/s11135-013-9898-1>
13. Singh, N., and others (2024). Greenwashing perception and attitude-intention relationship towards green products purchase: a mediating model. *Environment, Development and Sustainability*. <https://doi.org/10.1007/s10668-024-05486-5>
14. Di Pillo, F., Palombi, G., & Strazzullo, S. (2025). Does greenwashing wash away Gen Z's green purchase intention? *Business Strategy and the Environment*, 34(7), 9081–9092. <https://doi.org/10.1002/bse.70064>

15. Hua, Z., Huang, M., & Li, Q. (2025). The role of green self-identity in shaping consumer loyalty and repurchase intentions: A moderated mediation model in green marketing. *Asia Pacific Journal of Marketing and Logistics*. Advance online publication. <https://doi.org/10.1108/APJML-04-2025-0629>
16. Keilmann, J., & Koch, T. (2025). Little green lies: Greenwashing's detrimental impact on corporate perception and the interplay of perceived motives, skepticism and authenticity. *Corporate Communications: An International Journal*. Advance online publication. <https://doi.org/10.1108/CCIJ-05-2025-0108>
17. Nnindini, S. I., & Dankwah, J. B. (2024). Describing brown as green: An examination of the relationship between greenwashing and consumer negative emotive outcomes. *Cogent Business & Management*, 11(1), 1–18. <https://doi.org/10.1080/23311975.2024.2367781>
18. Sajid, M., Ertz, M., & Peethambaran, M. (2025). Does greenwashing dim green actions? Examining how greenwashing impacts consumers' pro-environmental intentions. *Social Responsibility Journal*, 21(10), 2336–2355. <https://doi.org/10.1108/SRJ-03-2025-0211>
19. Sun, Y., & Shi, B. (2022). Impact of greenwashing perception on consumers' green purchasing intentions: A moderated mediation model. *Sustainability*, 14(19), Article 12119. <https://doi.org/10.3390/su141912119>
20. Wang, T.-L., Pramuja, R., & Pitlam, A. R. (2025). Perceived greenwashing and consumer responses in hospitality: A cross-national study of Taiwan and Indonesia. *Advances in Tourism Studies*, 3(3), 111–128. <https://doi.org/10.53893/ats.v3i3.75>