



Analysis of the Influence of Environmental Factors on Green Trust, Green Satisfaction, and Green Perceived Quality among Wardah Cosmetic Consumers in the Special Region of Yogyakarta

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ARTICLE INFORMATION	ABSTRACT
Section Research Results Articles	This study aims to examine the effect of the environment on green trust, green satisfaction, green perceived quality on Wardah cosmetics consumers in the Special Region of Yogyakarta. In this study, the population used is both men and women in the Special Region of Yogyakarta who will or have used Wardah cosmetic products. The number of samples is 180 respondents with criteria aged 17-60 years. The analysis technique used in this study uses Structural Equation Modeling (SEM) which is processed with AMOS 22 and data collection using a purposive sampling technique. The results of this study indicate a positive influence from the influence of environmental friendliness on green trust, green satisfaction, and green perceived quality. In addition, this study also shows the positive influence of green satisfaction and green perceived quality on green trust.
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INTRODUCTION

Environmental issues such as pollution, deforestation, and global warming are increasingly severe, requiring heightened public awareness and action. Consumers are increasingly choosing environmentally friendly products to reduce ecological damage, prompting companies to innovate and provide sustainable offerings that align with growing green preferences (Walter, Mueller and Helfert, 2000; Kang and Hur, 2012; Chen, Lin and Weng, 2015). This trend reflects rising consumer concern for limited natural resources, health, and environmental degradation, as seen in preferences for natural-based cosmetics.

Consequently, marketers face both challenges and opportunities, leading to the adoption of green marketing strategies, including product modifications, sustainable



production processes, eco-friendly packaging, and environmentally oriented promotions (Ahmad, Lapien and Soegoto, 2016).

Green marketing is associated with environmentally sustainable products and widely applied across industries including cosmetics. Wardah exemplifies this strategy by using high quality halal ingredients that are safe for the environment and consumers' skin such as natural fats, collagen, elastin, placenta extract, vitamin stabilizers, alpha hydroxy acids, and hormones, fostering consumer trust and loyalty (Chen, 2010). Consumer engagement shapes effective green marketing strategies by influencing perceptions and purchasing behavior. Green marketing promotes products presumed environmentally safe while protecting internal and external environments through responsible practices (Hanifah, Arifin and Hidayat, 2016). Green perceived quality is measured through environmental benchmarks, trustworthiness, product performance quality, and professionalism (Putra and Rastini, 2017).

Prior research highlights the relationship between consumer green satisfaction and environmental friendliness. Chen (2010) found that green marketing activities demonstrating positive environmental attitudes and behaviors can meet consumer demands and enhance green satisfaction. When consumers engage in environmentally responsible behaviors, companies are motivated to improve product environmental quality through sustainable manufacturing, resulting in higher environmental performance. Green perceived quality positively influences green trust, serving as a key factor in fostering long-term customer relationships and shaping purchase intentions (Zhuang *et al.*, 2010). Green trust is defined as the willingness to rely on a product, service, or brand based on credibility, benevolence, and environmental performance (Chen, Lin and Weng, 2015), while green satisfaction reflects fulfillment from products meeting customers' environmental expectations. Green perceived quality represents consumers' overall assessment of a product's environmental excellence (Chen, Lin and Weng, 2015).

Wardah is one of the companies that implements green marketing and has been manufactured by PT Paragon Technology and Innovation (PTI) since 2011 (Rahmawati *et al.*, 2024). The brand is widely recognized for its cosmetic products formulated with halal and natural ingredients and certified by the Indonesian Council of Ulama (LP POM MUI) (Suara Muhammadiyah, 2025). Furthermore, Wardah's production process is designed to minimize environmental impact and ensure consumer safety. Considering previous studies and the growing relevance of environmental friendliness, green trust, green satisfaction, and green perceived quality in consumer decision making, this research aims to examine the effect of environmental friendliness on these three green marketing constructs among Wardah cosmetic consumers in the Special Region of Yogyakarta.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT (If Any)

Green Marketing

Green marketing emerged in the late 1980s and early 1990s as a strategic effort to promote environmentally and health-oriented business practices, also referred to as environmental, ecological, sustainable, greener, or social marketing. It involves integrating environmental considerations into all marketing activities, ensuring that products are produced with environmental responsibility (Kotler and Keller, 2016). Green marketing has evolved beyond a variation of conventional marketing, requiring firms to simultaneously develop high environmental-quality products and satisfy consumer expectations to succeed (Dangelico and Vocalelli, 2017). The rapid growth of research in this field highlights its development across time, with studies between 1993 and 2003 emphasizing shifts in research themes such as green communication, green consumers, recycling behavior, macro-marketing, and strategic approaches, although research volume began declining after 2001 (Kumar, Rahman and Kazmi, 2013).

Environmental Friendliness and Green Satisfaction

Consumers are more likely to choose environmentally friendly products when they engage in pro-environmental behaviors influenced by internal and external factors, such as reducing plastic use, proper waste disposal, conserving electricity, and minimizing environmental harm (Ritter *et al.*, 2015). Emotional attachment to environmental values further strengthens these behaviors. When companies demonstrate environmental commitment, consumers perceive greater product value and develop favorable attitudes toward green products (Chen, 2010). Prior studies show that green marketing strategies enable firms to meet environmentally conscious consumer expectations, enhancing green satisfaction (Chen, 2010; Chang, Chou and Lo, 2013). Environmental friendliness positively affects green satisfaction, reflecting fulfillment from products meeting ecological needs (Chen, Lin and Weng, 2015).

H₁: Environmental friendliness positively influences green satisfaction.

Environmental Friendliness and Green Perceived Quality

Increasing public awareness of global warming has heightened consumer interest in environmentally friendly products, prompting consistent purchases that support environmental preservation (Chen and Chang, 2013). This shift has driven companies to enhance environmentally responsible manufacturing, improving consumer recognition of products with superior ecological quality. Green perceived quality refers to consumers' overall evaluation of a brand's environmental performance. Environmental friendliness, defined as consumers' belief that a product meaningfully reduces environmental harm, has been shown to positively and significantly influence green perceived quality (Chen, Lin and Weng, 2015). Consequently, when consumers trust a product's environmental responsibility and perceive it as superior to alternatives, their assessment of the product's ecological quality increases.

H₂: Environmental friendliness positively influences green perceived quality.

Environmental Friendliness and Green Trust

Environmental friendliness plays a critical role in shaping consumer green trust. When consumers perceive that a product meets their environmental expectations and needs, they are more likely to develop confidence in and reliance on the product due to its credibility and environmental performance (Chen and Chang, 2013). Conversely, doubts about a product's environmental claims can weaken trust and reduce confidence in its ecological capabilities (Chen and Chang, 2012).

Environmental friendliness, defined as consumers' belief that a product effectively reduces environmental impact, has been shown to positively and significantly influence green trust (Chen, Lin and Weng, 2015). Green trust reflects consumers' willingness to depend on a product, service, or brand based on perceptions of its environmental integrity, benevolence, and capability, and higher perceptions of environmental friendliness are expected to strengthen this trust (Chen, Lin and Weng, 2015).

H₃: Environmental friendliness has a positive effect on green trust.

Green Satisfaction and Green Trust

Customer satisfaction is a central concept in modern marketing, serving as a primary indicator of consumer fulfillment and the extent to which expectations are met. Satisfied consumers are more likely to remain loyal and engage repeatedly with a brand, while dissatisfied customers are unlikely to repurchase, with Murga-Menoyo (2014) reporting that 91% of dissatisfied consumers will not return. High satisfaction levels strengthen customer–firm relationships,

increase repurchase intentions, and generate long-term benefits (Ranaweera and Prabhu, 2003). Customer satisfaction is critical in relationship management, fostering loyalty, trust, and positive word-of-mouth (Walter, Mueller and Helfert, 2000). Prior studies further show that satisfaction enhances consumer trust in products and service providers (Chen, Lin and Weng, 2015), making it a fundamental driver of sustainable customer relationships.

H4: *Customer Satisfaction has a positive effect on green trust.*

Green Perceived Quality and Green Trust

Chen and Chang (2012) define green perceived quality as consumers' evaluation of a product's superiority relative to expectations and environmental performance. Perceptions are shaped by both objective and perceived quality, which may differ from producers' perspectives due to incomplete information (Aaker, 2010). Prior research emphasizes reliance on perceived quality, influenced by ease of use, functionality, performance, service ability, and reputation (Sweeney, Soutar and Johnson, 1999; Brucks, Zeithaml and Naylor, 2000). Green perceived quality positively affects green trust (Chen and Chang, 2013; Chen, Lin and Weng, 2015), and higher perceived environmental value strengthens trust (Anuwichanont and Mechinda, 2009; Pratama, 2014), showing that superior environmental quality fosters consumer confidence and reliance.

H5: *Green perceived quality has a positive effect on green trust.*

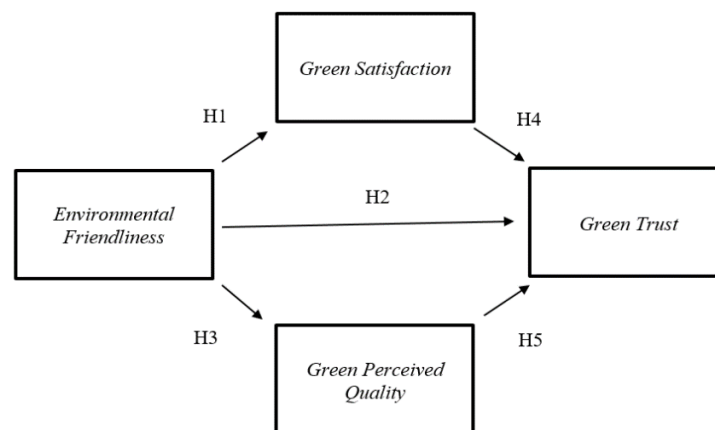


Figure 1. Research Framework

Source: Adapted from Chen, Lin and Weng (2015)

RESEARCH METHODS

This study adopts a quantitative research design using a structured online survey to collect primary data. A self-administered questionnaire with closed-ended items measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) was distributed via Google Forms, with measurement items detailed in Table 1. The research was conducted in the Special Region of Yogyakarta, Indonesia, chosen for its demographic diversity and responsiveness to information. A non-probability purposive sampling method targeted respondents aged 17–60 years who currently use or intend to use Wardah cosmetic products. Following SEM guidelines, a sample of 120–240 respondents was determined based on 24 measurement items to ensure sufficient statistical power and model reliability (Ferdinand, 2005; Ghozali and Fuad, 2005).

Data analysis employed descriptive statistics and structural equation modeling (SEM). Descriptive analysis was used to summarize respondent characteristics and research variables without generalizing beyond the sample (Sugiyono, 2016). SEM was selected to

simultaneously assess the measurement and structural models, ensuring robust evaluation of construct validity, reliability, and hypothesized causal relationships. All analyses were conducted using AMOS version 22.

Table 1. Item Measurement

Variables		Measurement
<i>Environmental Friendliness (EF)</i>	EF1	<i>Wardah products are environmentally friendly.</i>
	EF2	<i>Wardah does not cause harmful environmental impacts.</i>
	EF3	<i>Wardah is one of the most eco-friendly cosmetic brands.</i>
<i>Green Trust (GT)</i>	GT1	I believe Wardah's environmental claims are reliable.
	GT2	I think Wardah's environmental functions can be trusted.
	GT3	I trust Wardah's commitment to environmental protection.
	GT4	Wardah's environmental performance meets my expectations.
<i>Green Satisfaction (GS)</i>	GS1	I feel proud to choose Wardah due to its positive environmental image.
	GS2	I feel I made the perfect choice because Wardah offers strong environmental performance.
	GS3	I am satisfied with Wardah because it is environmentally friendly.
	GS4	I feel confident in my choice to purchase Wardah products.
	GS5	I am satisfied with Wardah's environmental benefits.
	GS6	I am highly satisfied with Wardah's environmental performance.
<i>Green Perceived Quality (GPQ)</i>	GPQ1	Wardah's product quality reflects its environmental commitment.
	GPQ2	Wardah's quality is reliable in terms of environmental performance.
	GPQ3	Wardah products demonstrate strong environmental performance.
	GPQ4	Wardah products are consistent in their environmental friendliness.
	GPQ5	Wardah demonstrates professional quality regarding environmental responsibility.

Source: Chen, Lin and Weng (2015)

Descriptive analysis of respondents offers an overview of the sample, including gender, age, occupation, income, residence, and information source. Responses were screened using purposive sampling, targeting individuals residing in the Special Region of Yogyakarta (DIY) who have purchased and used Wardah products. A total of 180 valid responses were collected and analyzed, with respondent profiles summarized in table 2 below:

Table 2. Descriptive Analysis of Demographic Variables

Demographic Variables	N	%
<i>Gender</i>		
Male	11	6,1
Female	169	93,9
<i>Age</i>		
<20 Years	140	77,8
21-30 Years	36	20
31-40 Years	3	1,7
41-50 Years	1	0,6
<i>Occupation</i>		
Private employee	1	0,6
Student / University student	176	97,8
Civil servant / Military / Police	2	1,1
Entrepreneur	1	0,6

Demographic Variables	N	%
<i>Monthly Income</i>		
< 1.000.000 IDR	128	71,1
1.000.000-2.500.000 IDR	36	20
2.500.000-7.500.000 IDR	12	6,7
>7.500.000 IDR	4	2,2
<i>Domicile</i>		
Bantul	4	2,2
Gunung kidul	4	2,2
Kulonprogo	1	0,6
Sleman	101	56,1
Yogyakarta	70	38,9

Source: Processed Primary Data (2021)

DATA ANALYSIS RESULTS & DISCUSSION

Validity & Reliability

Table 3. Data Validity and Reliability

Indicator	Validity Testing			Reliability Testing		
	Loading factor	Cut off	Note	CR	AVE	Note
EF1	0,846	0,5	Valid	0,891	0,730	Reliable
EF2	0,877	0,5	Valid			
EF3	0,842	0,5	Valid			
GT1	0,835	0,5	Valid			
GT2	0,827	0,5	Valid	0,900	0,690	Reliable
GT3	0,841	0,5	Valid			
GT4	0,823	0,5	Valid			
GS1	0,846	0,5	Valid			
GS2	0,830	0,5	Valid	0,930	0,720	Reliable
GS3	0,799	0,5	Valid			
GS4	0,898	0,5	Valid			
GS5	0,832	0,5	Valid			
GS6	0,898	0,5	Valid	0,929	0,680	Reliable
GPQ1	0,850	0,5	Valid			
GPQ2	0,811	0,5	Valid			
GPQ3	0,834	0,5	Valid			
GPQ4	0,791	0,5	Valid			
GPQ5	0,873	0,5	Valid			

Source: Processed Primary Data (2021)

Table 3 presents the validity and reliability results. An indicator is valid if its loading factor is $\geq 0,50$ (Hair Jr. *et al.*, 2019), and a variable is reliable if its composite reliability (CR) and average variance extracted (AVE) exceed 0,60. All indicators demonstrated loading factors above 0,50; with CR and AVE values exceeding 0,60; confirming that all indicators and variables are valid and reliable and supporting the robustness of the measurement model.

Table 4. Goodness-of-Fit Index Results for Variable-Level Validity Testing

Goodness of Fit Index	Cut-off Value	Environmental Friendliness	Green Trust	Green Satisfaction	Green Perceived Quality
Chi-square	Small	0	4,108	10,596	5,839
Significant Probability	$\geq 0,05$	-	0,128	0,304	0,211
CMIN/DF	≤ 2	-	2,054	1,177	1,46
RMSEA	$\leq 0,08$	-	0,077	0,031	0,051
GFI	$\geq 0,90$	1	0,989	0,981	0,988
AGFI	$\geq 0,90$	-	0,947	0,955	0,953
NFI	$\geq 0,90$	1	0,991	0,988	0,991
CFI	$\geq 0,90$	1	0,995	0,998	0,997
TLI	$\geq 0,90$	-	0,986	0,997	0,993

Source: Processed Primary Data (2021)

Table 4 presents the outlier test results, which identify extreme values in the dataset. Mahalanobis distances were compared against the chi-square threshold of 42,312 for 18 indicators at a 0,001 significance level, calculated using Excel (chiinv (0,001;18)). Observations with distances exceeding this value are considered multivariate outliers. The table shows the ten observations farthest from the centroid out of 100, all of which fall below 42,312; indicating that no outliers are present in the dataset.

Data Quality Assessment

Table 5. Normality Test

Indicator	min	max	Skew	c.r.	kurtosis
GT4	1	5	-0,259	-1,421	-0,021
GT3	1	5	-0,361	-1,975	-0,220
GT2	1	5	-0,295	-1,614	-0,437
GT1	1	5	-0,332	-1,820	-0,355
GPQ5	1	5	-0,045	-0,244	-0,633
GPQ4	1	5	-0,106	-0,581	-0,769
GPQ3	1	5	-0,269	-1,474	-0,458
GPQ2	1	5	-0,183	-1,004	-0,262
GPQ1	1	5	-0,095	-0,518	-0,325
GS6	1	5	-0,441	-2,413	-0,382
GS5	1	5	-0,181	-0,990	-0,555
GS4	1	5	-0,541	-2,963	-0,427
GS3	1	5	-0,444	-2,430	-0,107
GS2	1	5	-0,328	-1,795	-0,438
GS1	1	5	-0,599	-3,282	-0,347
EF3	1	5	-0,517	-2,831	-0,114
EF2	1	5	-0,432	-2,368	-0,423
EF1	1	5	-0,245	-1,342	-0,535
Multivariate		3,801		0,950	

Source: Processed Primary Data (2021)

Table 5 presents the results of the normality test, which evaluates whether the data meet the normality assumption. A dataset is considered normally distributed when the critical ratio (CR) value falls below the absolute threshold of $\pm 2,58$. The multivariate CR value obtained in this

study is 0.95, which lies within the acceptable range (−2,58 to 2,58) (Hair Jr. *et al.*, 2019). Therefore, it can be concluded that the data are normally distributed.

Table 6. Outlier Test

Observation number	Mahalanobis d-squared	p1	p2
71	41,074	0,001	0,235
145	35,436	0,008	0,443
51	34,101	0,012	0,378
148	30,515	0,033	0,843
146	30,006	0,037	0,806
30	29,860	0,039	0,703
180	28,350	0,057	0,892
151	28,289	0,058	0,822
150	28,129	0,06	0,760
85	27,892	0,064	0,716

Source: Processed Primary Data (2021)

Table 6 presents the outlier test results, which identify extreme values in the dataset. Mahalanobis distances were compared against the chi-square threshold of 42,312 for 18 indicators at a 0,001 significance level, calculated using Excel (chiinv (0,001;18)). Observations with distances exceeding this value are considered multivariate outliers. The table shows the ten observations farthest from the centroid out of 100; all of which fall below 42,312; indicating that no outliers are present in the dataset.

Structural Model

Table 7. Computation of Degrees Freedom (Default model)

Number of distinct sample moments:	171
Number of distinct parameters to be estimated:	42
Degrees of freedom (171 - 42):	129

Source: Processed Primary Data (2021)

Table 7 shows a positive degree of freedom (df) value of 129, indicating that the model is over-identified. Therefore, data analysis can proceed to the next stage.

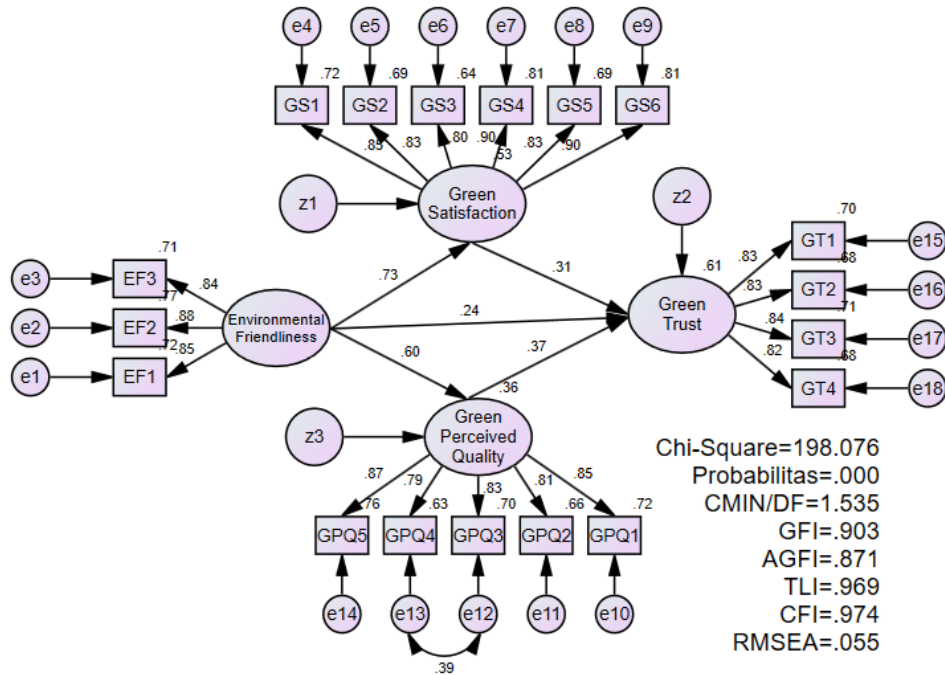


Figure 1. Structural Model Equation

Source: Processed Primary Data (2021)

Table 8. Hypothesis Test Results

		Estimate	S.E.	C.R.	P	Label
EF → GS	H1	0,822	0,087	9,432	***	Supported
EF → GPQ	H2	0,569	0,075	7,583	***	Supported
EF → GT	H3	0,227	0,090	2,511	0,012	Supported
GS → GT	H4	0,258	0,080	3,211	0,001	Supported
GPQ → GT	H5	0,370	0,083	4,438	***	Supported

Source: Processed Primary Data (2021)

Table 8 presents the regression weight results, indicating that all hypotheses are supported. Environmental friendliness significantly influences green satisfaction, green perceived quality, and green trust, demonstrating that consumers' environmental perceptions enhance satisfaction, perceived product quality, and trust. Additionally, both green satisfaction and green perceived quality show significant positive effects on green trust, confirming their key roles in strengthening consumer trust in Wardah's products.

Discussion

Environmental Friendliness positively influences Green Satisfaction

The analysis indicates a positive coefficient of 0,822 between environmental friendliness and green satisfaction, suggesting that higher perceived environmental friendliness enhances green satisfaction among Wardah users. This relationship is statistically significant ($p = 0,000$; $p < 0,05$); thereby supporting Hypothesis 1 and confirming that environmental friendliness positively influences green satisfaction. This finding implies that individuals with stronger pro-environmental attitudes tend to experience greater satisfaction when they encounter products aligned with their environmental values. The result is consistent with previous research by Chen, Lin and Weng (2015), which demonstrated that consumers' belief in environmentally responsible product attributes significantly and positively affects satisfaction, driven by products fulfilling their environmental expectations and needs.

Environmental Friendliness positively influences Green Perceived Quality

The result indicates a positive coefficient of 0,569 between environmental friendliness and green perceived quality, meaning that higher perceived environmental friendliness enhances consumers' evaluation of a product's environmental superiority. This relationship is statistically significant with a probability value of 0,000 ($p < 0,05$), confirming the effect. Thus, Hypothesis 2 (H2) is accepted, demonstrating that environmental friendliness positively influences green perceived quality. This implies that individuals with stronger pro-environmental attitudes tend to rate environmentally friendly products as superior. These findings are consistent with Chen, Lin and Weng (2015), who found that consumers' belief in a product's ability to reduce environmental impact positively and significantly improves their quality perceptions.

Environmental Friendliness positively influences Green Trust

The analysis shows a positive coefficient of 0,227 between environmental friendliness and green trust, indicating that greater perceived environmental friendliness leads to higher trust in Wardah products. This relationship is statistically significant with a probability value of 0,012 ($p < 0,05$); confirming the effect. Accordingly, Hypothesis 3 (H3) is accepted, demonstrating that environmental friendliness positively influences green trust. This suggests that individuals with stronger pro-environmental behavior are more likely to trust environmentally friendly products. These results support Chen, Lin and Weng (2015), who found that consumer belief in environmentally responsible products significantly increases willingness to trust brands, products, and services committed to environmental sustainability.

Green Satisfaction positively influences Green Trust

The results indicate a positive coefficient of 0,258 between green satisfaction and green trust, meaning that greater satisfaction with environmentally friendly products strengthens consumer trust in Wardah. The relationship is statistically significant with a probability value of 0,001 ($p < 0,05$); confirming the effect. Accordingly, Hypothesis 4 (H4) is accepted, demonstrating that green satisfaction positively influences green trust. This implies that the more satisfied consumers feel with eco-friendly products, the more likely they are to trust them. These findings are consistent with Chen, Lin and Weng (2015), who state that satisfaction with environmentally responsible products significantly enhances consumers' willingness to trust brands that demonstrate environmental commitment.

Green Perceived Quality positively influences Green Trust

The results reveal a positive coefficient of 0,37 between green perceived quality and green trust, indicating that higher perceived environmental product quality increases consumer trust in Wardah. The relationship is statistically significant with a probability value of 0,000 ($p < 0,05$); confirming a meaningful effect. Thus, Hypothesis 5 (H5) is accepted, establishing that green perceived quality positively influences green trust. This implies that when consumers perceive eco-friendly products as superior, their trust in the brand strengthens. These findings align with Chen, Lin and Weng (2015), who demonstrated that perceived environmental product quality significantly enhances consumers' willingness to trust environmentally responsible brands.

CONCLUSION

This study examined the influence of environmental friendliness on green satisfaction, green perceived quality, and green trust among Wardah consumers in Yogyakarta. The empirical

findings reveal that environmentally responsible behavior significantly enhances consumer satisfaction and perceived product quality, in line with Chen et al. (2015). These improvements subsequently strengthen consumer trust in green cosmetic products, indicating that trust is shaped not only by environmental positioning but also by consumers' positive experiences and evaluations of product performance. Thus, environmental values provide an essential foundation for loyalty, while consistent product quality serves as a critical mechanism for sustaining long-term trust in green brands.

Theoretically, this study contributes to the growing body of literature on green marketing and green consumer behavior by confirming the pivotal role of environmental friendliness, satisfaction, and perceived quality in building consumer trust. Practically, the findings emphasize that companies should not rely solely on environmental claims; instead, they must ensure superior product performance and integrate sustainability into innovation, branding, and communication strategies to enhance trust and strengthen competitive advantage in the green cosmetics market. Despite its contributions, this study is limited to Wardah consumers within a single regional context, which may restrict generalizability. Future research may explore comparative studies across brands or regions and expand the model by incorporating variables such as green brand image, environmental awareness, or green purchase intention to provide more comprehensive insights into green consumer behavior.

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