



Influence of Perceived Quality, Sustainable Material, and Safety on Purchase Intention of Recycled PET (rPET) Bottled Water: The Moderating Role of Green Scepticism

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ABSTRACT

This study aims to examine the influence of Perceived Quality, Sustainable Material, and Safety on the Purchase Intention of environmentally friendly bottled water packaged with recycled PET (rPET), with Green Scepticism as a moderating variable. Data were collected through a consumer survey and analysed using Structural Equation Modelling-Partial Least Squares (SEM-PLS) during July 2025. The results indicate that Sustainable Material and Safety have significant positive effects on purchase intention, whereas Perceived Quality shows no significant effect. Green Scepticism only moderates the relationship between safety and purchase intention. These findings have practical implications for enhancing sustainability communication and strengthening the credibility of safety labelling to promote the adoption of recycled products.

INTRODUCTION

Environmental sustainability has emerged as a global priority, particularly following the adoption of the Sustainable Development Goals (SDGs) in 2015. Among the most urgent objectives are the reduction of excessive consumption and the mitigation of plastic waste through circular economy innovations, including the development of eco-friendly packaging. Amid escalating global production and consumption, plastic pollution poses a severe threat to both marine and terrestrial ecosystems an issue particularly acute in Indonesia, currently ranked as the second-largest plastic polluter worldwide (Babaremu et al., 2022; Shen et al., 2020).

One notable sustainable initiative is the use of recycled polyethylene terephthalate (rPET) for bottled water packaging. Despite its potential, rPET adoption within Indonesia's bottled drinking water (AMDK) industry remains marginal, with estimates indicating less than 11% usage by 2024, despite early implementation by brands such as AQUA Life since 2019. Several barriers hinder market penetration, including consumer concerns regarding product quality and safety, as well as limited public literacy surrounding environmental claims (Baek Nayeon, 2025; Nguyen Quoc et al., 2025).

From a behavioural perspective, perceived quality, sustainable materials, and safety are key antecedents of purchase intention in the context of green products. However, green scepticism a psychological construct referring to consumer doubt regarding the authenticity of environmental claims—may attenuate or neutralise these effects (Hein, 2022; Zhang et al., 2024). This study aims to examine the influence of perceived quality, sustainable materials, and product safety on consumers' purchase intention towards environmentally friendly rPET-based bottled water, while exploring the moderating role of green scepticism among urban consumers in the Greater Jakarta area.

LITERATUR REVIEW

Stimulus–Organism–Response (S–O–R) Theory

The S-O-R model, introduced by Mehrabian and Russell (1974), explains how external environmental stimulus (S) affect the internal state of an individual (O), which then influences behavioural responses (R). In the context of green product consumption, elements such as product features (stimulus) affect consumers' cognitive and emotional processes (organism), which in turn shape behavioural intentions (response). The model is widely applied in environmental psychology and marketing to explain how sustainable product attributes drive consumer decision-making (Bettiga et al., 2025; Ofori et al., 2025).

Perceived Quality

Perceived quality refers to the consumer's evaluation of a product's overall excellence or superiority (Kotler & Keller, 2016). In the context of green packaging, perceived quality becomes essential due to concerns over whether recycled or biodegradable materials compromise the product's performance. Studies show that consumers tend to associate sustainable packaging with lower quality unless clear information is provided (Jin et al., 2024; Nguyen Quoc et al.,

2025). Nonetheless, when consumers trust that product performance is not sacrificed, perceived quality can become a strong driver of purchase intention.

H1: Perceived quality positively influences purchase intention towards rPET-packaged bottled water.

Sustainable Material

Sustainable material is defined as environmentally friendly raw material used in manufacturing that minimises ecological damage. Recycled polyethylene terephthalate (rPET) has emerged as a prominent innovation in sustainable packaging. Prior studies show that products using sustainable materials tend to be more positively evaluated by consumers who are environmentally conscious (Nguyen Quoc et al., 2025; Queiroz et al., 2021). The visibility of such materials on packaging, along with eco-certifications, can enhance consumers' perception and willingness to buy.

H2: Sustainable material positively influences purchase intention towards rPET-packaged bottled water.

Safety

Safety pertains to the perception of physical and health-related risks associated with a product, particularly important in food and beverage categories. Concerns about chemical leakage, contamination, and hygiene often arise in discussions about recycled plastic packaging (Baek Nayeon, 2025; Calvo-Porrall & Lévy-Mangin, 2020). Research indicates that high safety perception increases consumer trust and drives their intention to purchase green products, even when the material used is unfamiliar or novel.

H3: Perceived safety positively influences purchase intention towards rPET-packaged bottled water.

Green Scepticism

Green scepticism reflects consumers' doubts about the legitimacy of environmental claims made by companies (Obermiller & Spangenberg, 1998). While green branding is prevalent, not all consumers accept such messages at face value. Studies suggest that high scepticism reduces the effectiveness of green marketing and may moderate the impact of product features on purchase intention (Hein, 2022; Rosi & Ekasari, 2023; Zhang et al., 2024). Therefore, green scepticism is posited to weaken the influence of perceived quality, sustainable material, and safety on consumers' willingness to purchase.

H4: Green scepticism moderates the relationship between perceived quality and purchase intention.

H5: Green scepticism moderates the relationship between sustainable material and purchase intention.

H6: Green scepticism moderates the relationship between safety and purchase intention.

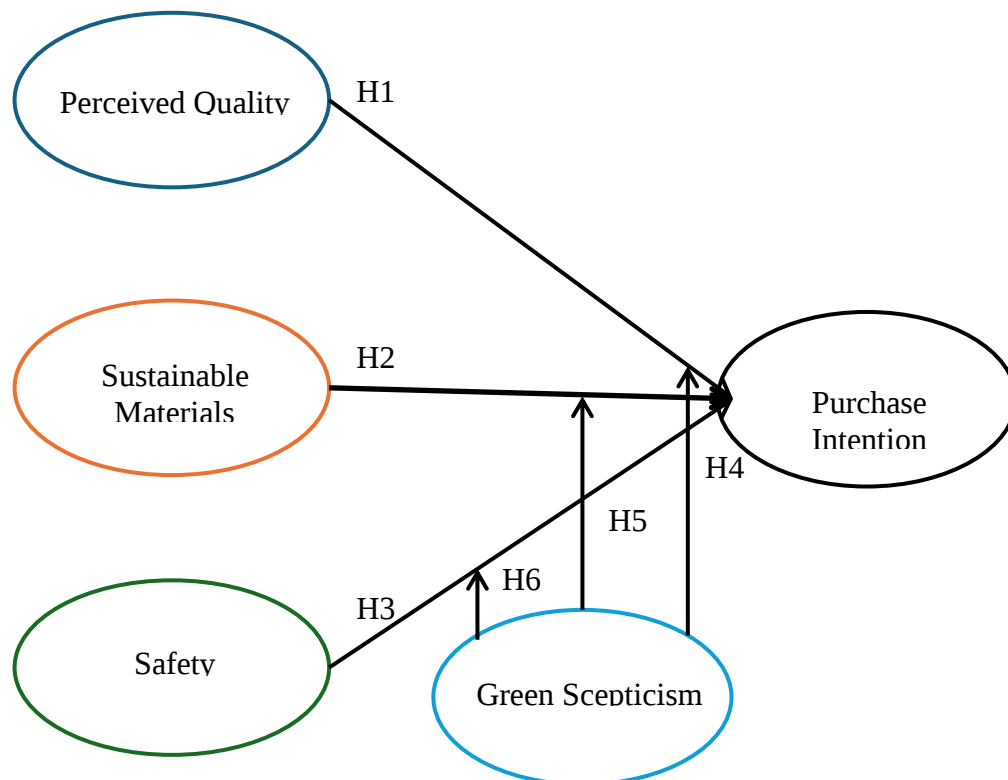


Figure 1. Conceptual Framework

METHODOLOGY

This study applied a quantitative causal approach grounded in positivist philosophy, aiming to examine the effect of perceived quality, sustainable material, and safety on purchase intention, with green scepticism acting as a moderating variable. The correlational design was used to identify the relationships among variables. The population consisted of bottled water consumers residing in Jabodetabek. A non-probability purposive sampling technique was employed, targeting individuals who (1) are AMDK consumers, (2) are aware of rPET-packaged products, and (3) are aged 18 years or older. The minimum sample size was calculated using G*Power 3.1, resulting in 138 respondents; to ensure statistical reliability, 210 responses were collected. Primary data were gathered via online questionnaires using a 5-point Likert scale. Each construct was measured through multiple indicators adopted from previous studies. The instrument was distributed digitally via Google Forms. Data analysis employed Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 4.0. The analysis involved two stages: (1) assessment of the measurement model to ensure validity and reliability, and (2) evaluation of the structural model to test hypotheses and assess model fit. Bootstrapping was used to determine the significance of relationships, with moderation tested through interaction terms and slope analysis.

RESEARCH RESULT

Outer Model

This validity is assessed by examining the *outer loading* (or *loading factor*) of each indicator in relation to its construct. An indicator is considered valid

when its outer loading exceeds 0.70, whereas indicators scoring below this threshold are removed from the model and subsequently re-evaluated. According to Hair (2022), a factor loading value greater than 0.70 is recommended.

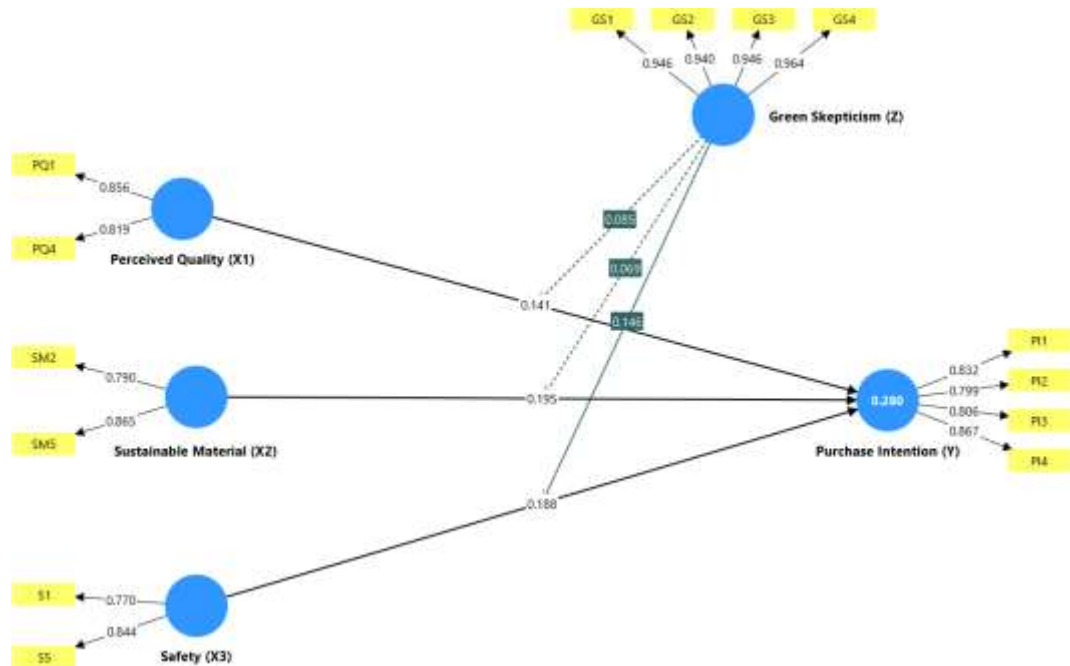


Figure 2. Graphical Output – PLS SEM Algorithm

Referring to Figure 2, all indicators exhibit loading factor values exceeding 0.70, indicating that the construct validity of the measurement model is satisfactorily established and can be deemed reliable.

Convergent Validity

Convergent validity may additionally be evaluated through the Average Variance Extracted (AVE), whereby values exceeding the recommended benchmark of 0.50 are indicative of adequate construct validity (Hair et al., 2022).

Table 1. Validity – Overview

Variabel	Average variance extracted (AVE)	Condition	Result
Perceived Quality (X1)	0.702	> 0.5	Valid
Sustainable Material (X2)	0.686	> 0.5	Valid
Safety (X3)	0.652	> 0.5	Valid
Green Scepticism (Z)	0.901	> 0.5	Valid
Purchase Intention (Y)	0.683	> 0.5	Valid

Source: Results of Data Processing Using SmartPLS 4.0 (2025)

Table 2 indicates that the AVE values for all variables exceed the threshold of 0.50. These results demonstrate satisfactory convergent validity, confirming that each construct accounts for more than 50% of the variance in its respective indicators.

Reliability

In PLS analysis, reliability assessment is undertaken through the Composite Reliability measure, which evaluates the internal consistency of each construct in relation to its respective indicators. According to Hair et al. (2022), a Composite Reliability value greater than 0.70 is indicative of satisfactory reliability.

Table 2. Reliability – Overview

	<i>Composite reliability</i>	Condition	Result
<i>Perceived Quality (X1)</i>	0.825	> 0,7	Reliabel
<i>Sustainable Material (X2)</i>	0.813	> 0,7	Reliabel
<i>Safety (X3)</i>	0.789	> 0,7	Reliabel
<i>Green Scepticism (Z)</i>	0.973	> 0,7	Reliabel
<i>Purchase Intention (Y)</i>	0.896	> 0,7	Reliabel

Source: Results of Data Processing Using SmartPLS 4.0 (2025)

As shown in Table 2, all variables exhibit Composite Reliability values above the recommended threshold of 0.70, thereby affirming that the indicators associated with each latent construct operate with sufficient internal consistency to reliably represent the underlying theoretical dimensions.

Inner Model

Statistical Hypothesis

In hypothesis testing, the null hypothesis (H_0) is rejected when the p-value is less than 0.05 or when the calculated *t*-statistic exceeds the critical *t*-value, indicating a statistically significant relationship between the latent variables. Conversely, when the p-value exceeds 0.05 or the *t*-statistic is below the critical threshold, H_0 is accepted, signifying that the relationship is not statistically significant.

Table 3. Path Coefficient

Variabel	<i>Original sample (O)</i>	<i>Sample mean (M)</i>	<i>T statistics (O/STDEV)</i>	P values	Information
Perceived Quality (X1) -> Purchase Intention (Y)	0.141	0.145	1.860	0.063	Has a positive and insignificant effect Hypothesis 1 is rejected
Sustainable Material (X2) -> Purchase Intention (Y)	0.195	0.202	3.073	0.002	Has a positive and significant effect Hypothesis 2 is accepted

Safety (X3) -> Purchase Intention (Y)	0.188	0.198	2.555	0.011	Has a positive and significant effect Hypothesis 3 is accepted
Green Scepticism (Z) x Perceived Quality (X1) -> Purchase Intention (Y)	0.085	0.079	0.953	0.341	Not moderating Hypothesis 4 rejected
Green Scepticism (Z) x Sustainable Material (X2) -> Purchase Intention (Y)	0.069	0.074	0.925	0.355	Not moderating Hypothesis 5 rejected
Green Scepticism (Z) x Safety (X3) -> Purchase Intention (Y)	0.146	0.152	2.163	0.031	Moderate Hypothesis 6 accepted

Source: Results of Data Processing Using SmartPLS 4.0 (2025)

The results indicate that sustainable material and safety exert significant positive effects on purchase intention, while perceived quality shows a positive but non-significant effect. Green scepticism significantly moderates only the relationship between safety and purchase intention.

DISCUSSION

Based on the empirical results obtained, each proposed hypothesis is examined in detail to provide a clear understanding of the relationships among the variables investigated. The discussion systematically addresses the outcomes of hypothesis testing, including coefficient values, levels of statistical significance, and interpretations grounded in relevant theoretical frameworks and the research context. It also considers factors influencing these results, whether they support the hypotheses or deviate from the initial predictions. Through this approach, the discussion offers a comprehensive perspective on the dynamics between variables and provides valuable insights for theoretical development and practical application in the relevant field.

Influence of Perceived Quality on Purchase Intention

The findings indicate that Perceived Quality exerts a positive but statistically non-significant effect on Purchase Intention. While respondents acknowledge the acceptable quality of environmentally friendly rPET-packaged bottled water, this perception alone does not significantly strengthen their intention to purchase. This result suggests that consumers' evaluations of product quality, although positive in direction, may not be sufficiently strong to act as a primary determinant of purchase intention. Possible explanations include

limited direct experience with rPET products, insufficient exposure to credible visual cues or labelling, or persistent bias against recycled packaging.

From the perspective of the Stimulus–Organism–Response (S-O-R) framework, Perceived Quality serves as an external stimulus intended to elicit internal evaluations (organism) such as perceptions, attitudes, and beliefs, ultimately leading to the behavioural response of purchase intention. In this case, however, the stimulus of quality perception may be outweighed by negative perceptions shaped by Green Scepticism or may lack the strength to alter consumers' risk perceptions and trust in rPET products.

These findings are consistent with Thu et al., (2019), who report that while perceived quality is important for forming purchase intention towards eco-friendly products, its effect can be diminished by negative perceptions or distrust towards sustainability claims. Similarly, Calvo-Porrà & Lévy-Mangin, (2020) note that recycled products often face an inherent stereotype of inferiority, which can undermine the role of perceived quality in consumer decision-making.

Influence of Sustainable Material on Purchase Intention

The results show that Sustainable Material has a positive and statistically significant effect on Purchase Intention. This indicates that the more positively consumers perceive the sustainability of packaging materials such as rPET, the greater their intention to purchase the product. Consumers in this study demonstrated sensitivity to environmental attributes, especially when clearly communicated through labelling or packaging design. Within the S-O-R framework, Sustainable Material represents a product attribute that signals resource efficiency and environmental responsibility, triggering both cognitive and affective evaluations (organism) such as environmental awareness, perceived corporate social responsibility, and the symbolic value of green consumption. These internal processes, in turn, lead to a behavioural response in the form of increased purchase intention.

The results align with Queiroz et al., (2021) who found that perceptions of recycled materials such as rPET significantly boost purchase intention in Brazil's circular economy, particularly when sustainability information is conveyed clearly and authentically. Similarly, Calvo-Porrà & Lévy-Mangin, (2020) emphasise that consumer trust in the authenticity of materials and environmental benefits is essential for the success of circular economy models in driving adoption of recycled products.

Influence of Safety on Purchase Intention

The analysis reveals that Safety exerts a positive and significant influence on Purchase Intention. This highlights that perceived product safety is a key determinant of consumers' purchasing decisions for rPET-packaged bottled water. Higher consumer confidence in the safety of rPET-packaged water – covering hygiene, absence of harmful chemicals, and compliance with food safety standards correlates with a greater intention to purchase. Safety is not only evaluated technically but also psychologically, encompassing trust and comfort in consuming products packaged in recycled materials.

In the S-O-R framework, Safety acts as an external stimulus influencing internal states such as risk perception, trust, and feelings of security, which in turn drive purchase intention. Features such as “BPA-free” labels, official certifications, and transparent ingredient disclosures are critical in shaping these consumer responses. These findings are consistent with Luu & Baker, (2021), who demonstrate that trust in the safety of recycled materials directly encourages purchase intention, particularly for products intended for direct consumption.

Moderating Role of Green Scepticism in the Perceived Quality-Purchase Intention Relationship

The analysis shows that Green Scepticism does not significantly moderate the relationship between Perceived Quality and Purchase Intention. This suggests that scepticism towards environmental claims neither strengthens nor weakens the effect of perceived quality on purchase intention. Within the S-O-R framework, Perceived Quality functions as an external stimulus, while Green Scepticism forms part of the organism, potentially influencing the processing of quality-related stimuli. However, the absence of a moderating effect implies that quality perception remains largely independent from scepticism levels.

This result diverges from Thu et al., (2019), who found that green scepticism can significantly reduce purchase intention by weakening positive perceptions of quality and sustainability. Nevertheless, it aligns with Calvo-Porral & Lévy-Mangin, (2020), who argue that quality perceptions can remain a consistent driver of purchase intention in circular economy contexts when functional and aesthetic standards are met.

Moderating Role of Green Scepticism in the Sustainable Material-Purchase Intention Relationship

The findings indicate that Green Scepticism does not significantly moderate the Sustainable Material-Purchase Intention relationship. This suggests that perceptions of sustainable materials such as rPET are positively maintained regardless of consumers’ scepticism levels. In the S-O-R model, Sustainable Material acts as the external stimulus, while Green Scepticism represents a cognitive factor within the organism. The absence of moderation suggests that consumers evaluate sustainable materials based on tangible attributes often verifiable visually or through prior experience rather than being heavily influenced by scepticism towards environmental messaging.

These findings differ from Sio et al., (2022), who found that scepticism towards eco-labels can weaken purchase intention by reducing trust in sustainability claims. However, in the context of rPET bottled water, consumers may place greater trust in recycled material claims due to consistent and credible communication by established brands such as AQUA, as well as their participation in bottle return initiatives. Similar patterns were observed by Queiroz et al., (2021) in Brazil, where perceptions of sustainable materials were more strongly shaped by tangible quality and recyclability than by scepticism towards corporate sustainability claims.

Moderating Role of Green Scepticism in the Safety-Purchase Intention Relationship

The final analysis confirms that Green Scepticism significantly moderates the relationship between Safety and Purchase Intention. The slope analysis indicates that lower levels of green scepticism strengthen the positive relationship between safety and purchase intention. In other words, when consumers perceive rPET-packaged products as safe and have minimal doubt about environmental claims, their intention to purchase is considerably higher.

From an S-O-R perspective, Safety functions as the external stimulus, communicated through product labelling such as “BPA-free” or “food grade”. This stimulus is expected to foster protective perceptions (organism), leading to a purchase intention response. Green Scepticism, however, influences the extent to which these safety cues are trusted; consumers with high scepticism may dismiss safety claims lacking transparent evidence or credible third-party certification.

These results are in line with Luu & Baker, (2021), who observed that highly sceptical consumers tend to question the validity of safety labelling in rPET products unless supported by comprehensive and transparent information. Similarly, Queiroz et al., (2021) highlight the importance of producer transparency in conveying technical details related to safety, such as sterilisation processes and material resistance to contamination.

Thus, green scepticism plays a pivotal role in either amplifying or attenuating the perceived safety of rPET products. To mitigate the negative impact of scepticism, companies should enhance the credibility of safety labelling through verifiable evidence, including independent certifications, QR code-enabled transparency, and consumer education campaigns.

CONCLUSION AND RECOMMENDATIONS

The study reveals that sustainable material attributes and safety perceptions are the primary drivers of purchase intention for bottled water packaged with recycled PET (rPET), while perceived quality, although positive, does not exert a significant influence. Green scepticism plays a selective moderating role, amplifying the effect of safety perceptions on purchase intention but showing no significant impact on the relationships involving perceived quality and sustainable material. These findings emphasise that tangible product attributes, particularly those verifiable through direct experience or credible certification, are more influential in shaping consumer behaviour than abstract perceptions of quality. From a practical standpoint, producers should reinforce sustainability communication through transparent labelling and credible safety assurances, supported by verifiable evidence such as independent certifications and QR code-enabled product information. Reducing consumer scepticism requires continuous education and engagement initiatives that foster trust in environmental claims. Theoretically, this research extends the application of the Stimulus-Organism-Response framework to the adoption of recycled products, highlighting the nuanced role of scepticism in moderating consumer responses. Future research could explore other psychological and contextual factors influencing purchase intention, as well as

testing communication strategies that effectively convey the value of recycled materials across diverse market settings.

ADVANCED RESEARCH

Like any empirical study, this research is subject to certain limitations. The sample was restricted to consumers within a specific geographical context and product category, which may limit the generalisability of the findings to other markets or consumer segments. The study also relied on self-reported measures, which are susceptible to social desirability bias and may not fully capture actual purchasing behaviour. Furthermore, the cross-sectional design limits the ability to establish causality between the examined variables.

Future research could address these limitations by employing longitudinal or experimental designs to validate the causal relationships observed. Expanding the investigation to other product categories and cultural contexts would provide a broader understanding of how sustainable material attributes, safety perceptions, and green scepticism influence purchase intention. Incorporating behavioural data, such as actual purchase records or field experiments, could enhance the robustness of the findings. Additional psychological constructs, including environmental concern, perceived behavioural control, and brand trust, may also be integrated to develop a more comprehensive model of consumer decision-making in the context of recycled products.

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