

The Plastic Bottle as a Market Device: A PRISMA Systematic Review of Sustainable Packaging, Environmental Awareness, and Consumer Purchase Intention

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Abstract: The single-use plastic water bottle represents a highly optimized market device that has successfully commodified a vital public resource. However, its immense convenience generates severe environmental externalities, leading to a corporate shift towards sustainable packaging alternatives. Although empirical studies on eco-friendly packaging are rapidly expanding, a comprehensive synthesis of how these material changes structurally activate consumer psychology is lacking. This systematic literature review employs the PRISMA guideline to evaluate and synthesize current academic evidence regarding the repercussion of sustainable packaging on consumers willingness to buy, specifically examining the mediating role of environmental awareness. A systematic search of major digital databases (including Scopus and Web of Science) was performed for peer-reviewed studies published between 2016 and 2026. Applying strict inclusion and exclusion criteria, a final pool of relevant empirical articles was selected and qualitatively synthesized. The synthesis reveals that while sustainable packaging changes (such as rPET and bioplastics) act as critical structural visual cues, their direct effect on purchase intention is highly volatile and bounded by price premiums. Importantly, the literature consistently identifies environmental awareness as a key psychological mediator; sustainable packaging attributes are most effective when they

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successfully trigger a consumer's internal eco-consciousness and situational guilt. This research straddles the disciplines of economic sociology and green marketing, as it re-theorizes the sustainable bottle, not simply as a container, but as a pedagogical market device. The results offer managerial implications to beverage manufacturers for optimizing eco-branding strategies and policy-makers evidence to support extended producer responsibility frameworks.

Keywords: Sustainable Packaging, Market Device, Environmental Awareness, Purchase Intention, Bottled Mineral Water, PRISMA Review.

Introduction

Explaining The contemporary global food and beverage supply chain relies fundamentally on single-use packaging, a reality that simultaneously drives economic efficiency and generates unprecedented municipal solid waste ([Elroi et al., 2023](#)). Within this landscape, the plastic polyethylene terephthalate (PET) water bottle stands as one of the most ubiquitous objects on Earth, executing a pivotal historical shift from municipal tap water systems to the privatized consumption of portable, branded plastic water ([Hawkins, Potter, & Race, 2017](#)). Far from being a neutral, passive container designed merely for transport and protection, economic sociologists define the plastic bottle as an active market device, a physical mechanism that creates, structures, and facilitates economic action ([Callon, 1998](#); [Hawkins, 2012](#)). By embedding qualities of absolute clarity, safety, and individual convenience into consumer routines, this device has successfully stabilized the global commodification of a vital public resource ([Hawkins et al., 2017](#)). However, the structural arrangement that allows the beverage industry to thrive relies on a profound paradox: the value of the plastic water bottle is realized exactly on the notion that the material object is immediately "wasted" once its contents are consumed ([Guo et al., 2021](#)). This intentional accumulation of single-use waste has triggered critical ecological externalities, converting coastlines and landfills into visible evidence of market failure and evoking severe environmental anxiety among modern consumers ([Ruippo et al., 2023](#); [Elroi et al., 2023](#)). In response to rising regulatory mandates, the threat of climate change, and evolving stakeholder pressures, the global packaging market is undergoing an urgent green transition ([Misopoulos & Bajiraj, 2026](#)). Companies are increasingly forced to redesign their market devices, shifting from conventional native PET toward sustainable alternatives such as recycled PET (rPET), bioplastics, and lightweight structural reductions ([Singh & Pandey, 2018](#)). Within this transition, a major academic and corporate debate has emerged regarding the efficacy of these sustainable packaging innovations. In the self-service retail environment, packaging serves as a critical visual medium at the exact moment of decision-making ([Chandon, 2013](#); [Kauppinen-Räsänen et al., 2020](#)). While mainstream

economic assumptions imply that substituting conventional plastic with sustainable packaging will directly translate into increased green purchase intentions, recent empirical studies reveal that consumer responses are highly non-linear and bounded by intense price sensitivities ([Ansu-Mensah, 2021](#); [Misopoulos & Bajiraj, 2025](#)). Physical packaging changes frequently fail to drive actual sales if the product carries a significant price premium, or if consumers lack the underlying psychological drivers necessary to process the green cue ([Mahmoud et al., 2022](#)). This behavioral inconsistency underscores the critical role of psychological intervening variables most notably, environmental awareness and green consumer values ([Yadav et al., 2026](#); [Laheri, 2024](#)). Guided by behavioral theoretical models like the Value-Belief-Norm (VBN) and the Theory of Planned Behaviour (TPB) theory, contemporary researchers argue that eco-friendly packaging does not change buying behavior by itself; rather, it functions as a pedagogical device that triggers internal consumer consciousness and moral accountability ([Stern, 2000](#)). When consumers finish a product and confront its disposal, the material properties of the packaging become heavily moralized, inviting recycling work and activating pro-environmental attitudes ([Fuentes & Samsioe, 2021](#); [Elroi et al., 2023](#)). Therefore, environmental awareness emerges as a central psychological mediator that determines whether a sustainable market device successfully translates structural eco-labeling into an actual green purchase decision ([Yadav et al., 2026](#); [Laheri, 2024](#)). Previous research studies have extensively reviewed sustainable packaging and green consumer behaviour, but the existing evidence is scattered across different research streams. Some reviews focus on packaging innovation and material development, while others examine circular economy initiatives or pro-environmental consumer behaviour. Little attention has been paid to explain how sustainable packaging influences purchase intention through environmental awareness. This gap is particularly evident in the bottled mineral water sector where packaging is not only a protective container but also a visible product attribute affecting consumers' perceptions and purchasing decisions. Building on this limitation, the present systematic review integrates evidence from marketing, consumer behavior, and economic sociology to provide a broader understanding of sustainable packaging. Instead of merely reviewing the previous empirical findings, this review explores environmental awareness as the mechanism linking sustainable packaging with purchase intention and clarifies the relationship using the plastic bottle as a market device. The review is conducted according to the PRISMA 2020 guidelines, emphasizing bottled mineral water packaging to provide a more coherent synthesis of the existing literature and to identify implications for future research and managerial practice. Despite a massive surge in isolated empirical papers testing these specific structural pathways, the literature remains fragmented across disciplines. Green marketing studies focus heavily on statistical path coefficients of purchase intentions, while economic sociology focuses on macro-critiques of corporate resource control. There is a

glaring lack of unified evidence synthesizing how physical, sustainable modifications to the mineral water bottle structurally alter its function as a market device to activate consumer psychology. To bridge this gap, this research performs a comprehensive systematic literature review adhering to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. By systematically collecting, filtering, and synthesizing empirical literature published between 2016 and 2026, this paper maps the interconnections between sustainable packaging design, the mediating mechanics of consumer environmental awareness, and ultimate purchase intentions in the global bottled water sector.

Research Method

The methodological procedures employed in this study were designed to ensure that the review process was systematic, transparent and reproducible. The review was conducted according to the PRISMA 2020 guidelines. Literature identification, study selection, eligibility assessment, data extraction and qualitative synthesis were performed to obtain comprehensive evidence regarding sustainable packaging, environmental awareness and purchase intention ([Page et al., 2021](#)).

Research Design

This study adopted a Systematic Literature Review (SLR) as its research design to systematically review and synthesize the empirical evidence of the relationships among sustainable packaging, environmental awareness and purchase intention. The systematic, transparent and reproducible approach to identify, appraise and synthesize the results of previous studies made SLR the selected method ([Tugwell & Tovey, 2021](#)). The SLR increases the reliability and credibility of the synthesized evidence by reducing selection bias through the application of predetermined procedures during the entire review process, unlike traditional narrative reviews. The review was performed according to the PRISMA 2020 guidelines. PRISMA is an internationally accepted framework that improves the transparency of systematic reviews by providing standardised procedures for the identification, screening, eligibility assessment and inclusion of studies. These guidelines were adhered to in an effort to ensure that the process of review was completed in a systematic and transparent manner that was easily replicable and critically appraised by other researchers. The SLR approach has been found to be suitable for this study as the research on sustainable packaging, environmental awareness and purchase intention has grown rapidly among a number of fields such as marketing, consumer behavior, environmental management and economic sociology. But there are many empirical studies that investigate these variables, but their findings are dispersed and sometimes contradictory due to differences in research environment, theoretical perspectives and methodological techniques. Thus, a systematic review is a proper

approach to gather the existing evidence, detect trends and contradictions, and create a more complete view of the effect of sustainable packaging on consumer purchase intention through environmental awareness. The review was performed in six consecutive stages: research design, literature search, eligibility assessment, study selection, data extraction and qualitative synthesis. A comprehensive synthesis of the literature was generated using predefined criteria to guide each stage, ensuring methodological consistency. The procedures used at the different stages are described in the following subsections.

Literature Search Strategy

The SLR search was performed by three main academic databases; namely Scopus, Web of Science and Google Scholar. These databases were selected because they provide a comprehensive coverage of peer-reviewed publications in the areas of marketing, consumer behavior, sustainability and environmental studies. The databases were selected because they index high quality international journals with rigorous peer-review standards (Scopus and Web of Science), and Google Scholar was added to broaden the search coverage and to reduce the chance of missing relevant empirical studies that might not be indexed in the other databases. To ensure that the review captures the most recent developments in the literature, only articles published from 2016 to 2026 were included. The reason for choosing the publication period is the rapid development of research on sustainable packaging in the last decade, particularly following the increasing global attention to circular economy, reduction of plastic waste, and sustainable consumption. Restricting the search to this period helped to synthesize current evidence that is relevant to current academic and industrial developments.

The search process was based on predefined keywords which were aligned with the objectives of the current review. Boolean operators (AND and OR) were used to combine search terms to increase the accuracy of the retrieval process. The key search terms were “sustainable packaging”, “green packaging”, “environmental awareness”, “environmental concern”, “purchase intention”, “buying intention”, “plastic bottle” and “bottled mineral water”. Below is a sample search string used in the database search: (“sustainable packaging” OR “green packaging”) AND (“environmental awareness” OR “environmental concern”) AND (“purchase intention” OR “buying intention”) AND (“plastic bottle” OR “bottled mineral water”). To ensure quality and relevance of evidence, the search was limited to English peer-reviewed journal articles. Additional filters were applied to remove duplicate records and publications not directly related to the research objectives. The retrieved articles were then processed through the PRISMA 2020 study selection procedure before being assessed for eligibility.

Eligibility Criteria

The eligibility criteria were established before the screening of the literature to include relevant and methodologically sound studies in the review. The criteria were framed according to the study's objectives and consistently used during both screening and eligibility assessment phases. Studies meeting all inclusion criteria were retained for qualitative synthesis, whereas those meeting any exclusion criterion were excluded from further analysis. Detailed inclusion and exclusion criteria are shown in Table 1.

Table 1 Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Peer-reviewed journal articles	Conference papers, books, book chapters, editorials, and review articles
Published between 2016 and 2026	Articles published before 2016
Written in English	Publications in languages other than English
Empirical studies using quantitative, qualitative, or mixed-method approaches	Studies without empirical data
Examined sustainable packaging in relation to environmental awareness and/or purchase intention	Studies unrelated to sustainable packaging, environmental awareness, or purchase intention
Full-text articles available for review	Publications with inaccessible full texts

The criteria for eligibility presented in Table 1 were applied in the screening and full-text assessment stages to ensure that the studies that were relevant were comparable from a methodological perspective. Articles that met all the inclusion criteria and none of the exclusion criteria were included in the qualitative synthesis. The application of these criteria has facilitated a transparent and systematic process for selecting the studies and has reduced the probability of including irrelevant or methodologically weak publications.

Study Selection Process

Study selection process was based on the PRISMA 2020 framework and was conducted in four consecutive phases: identification, screening, eligibility and inclusion. In the identification phase, the literature search performed in the Scopus, Web of Science, and Google Scholar databases resulted in 265 records. After the removal of 47 duplicate records, 218 unique articles were screened by title and abstract. In the screening stage, the titles and abstracts of the retrieved articles were screened based on the predetermined eligibility criteria. A total of 143 articles were excluded since they did not meet the research objectives or were outside the scope of sustainable packaging, environmental awareness and purchase intention. Thus, 75 articles were eligible for full-text assessment. Eligibility assessment was carried out by a full-text review of articles to evaluate the methodological appropriateness and relevance for the

objectives of this study. Eight articles were excluded because the full text could not be assessed for eligibility. Of the remaining studies, 33 articles were excluded due to insufficient methodological rigor, the absence of environmental awareness as a key variable, the lack of purchase intention analysis, or overlapping datasets. Ultimately, 34 empirical studies satisfied all eligibility criteria and were included in the qualitative synthesis. The overall study selection procedure is illustrated in the PRISMA flow diagram presented in Figure 1.

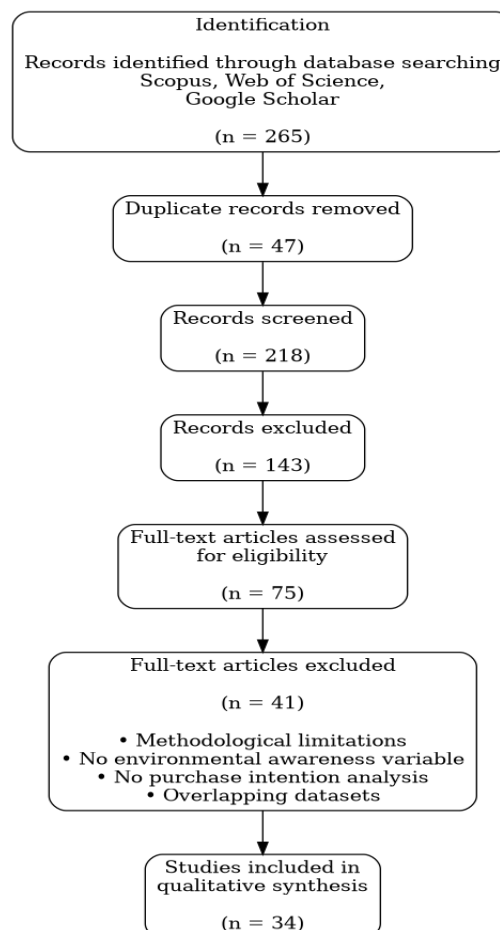


Figure 1 PRISMA 2020 Flow Diagram of the Study Selection Process

The process of study selection is presented in Figure 1 and was performed in four consecutive phases in accordance with the PRISMA 2020 framework (identification, screening, eligibility, and inclusion). The first search in the database yielded 265 records, 47 of which were duplicates and were excluded. The remaining 218 records were screened based on their titles and abstracts, and studies that did not meet the predefined eligibility criteria were excluded. Subsequently, a full-text assessment was carried out to evaluate the methodological relevance and consistency of the remaining studies with the objectives of this review. After the eligibility assessment, 34 empirical studies met all selection criteria and were included in the qualitative synthesis. Studies for the final analysis were selected through a systematic selection process that considered relevance and methodological appropriateness.

Quality Assessment, Data Extraction, and Data Synthesis

After the eligibility assessment, the methodological quality of the selected studies was evaluated to ensure that the evidence included in this review was relevant, reliable, and aligned with the research objectives. The assessment was based on the clarity of the research objectives, the appropriateness of the research design, the suitability of the research methodology, the relevance of the variables investigated, and the consistency of the findings reported. Studies that lacked methodological transparency, did not explore the relationships between sustainable packaging, environmental awareness, and purchase intention, or provided insufficient empirical evidence were excluded from the qualitative synthesis. Data extraction was then conducted using a standardized extraction form to maintain consistency across all selected studies. The extracted information included the author(s), publication year, country of study, research methodology, sample characteristics, theoretical framework, variables investigated, and the principal findings. This information was systematically organized to facilitate comparison across the selected studies. The extracted data were synthesized using a qualitative narrative synthesis approach. To investigate similarities and differences among the selected studies, the studies were compared based on research contexts, methodological approaches, theoretical perspectives, and empirical findings. With the synthesis, the aim was to find recurring patterns, inconsistencies and emerging themes in relation to the relationships between sustainable packaging, environmental awareness and purchase intention. The synthesized findings are presented in the next section through descriptive analysis, summary tables and conceptual interpretation.

Result and Discussion

Bibliometric and Structural Profile of Selected Studies

A systematic screening process resulted in a final collection of 34 empirical articles that investigated the relationship between sustainable packaging, environmental awareness, and consumers' purchase intentions in the bottled water industry. The characteristics of the reviewed articles are summarized in Table 2, which presents the authors, publication year, country, research methodology, research focus, and key findings of the selected articles.

Table 2 Summary of the Reviewed Studies

Authors	Country	Methodology	Research Focus	Main Findings
Hawkins, Potter, & Race	Australia	Qualitative	Plastic bottle, market device	Plastic bottles function as market devices that shape consumer practices and the commodification of bottled water.

Hawkins	Australia	Conceptual Study	Packaging, market device, waste	Packaging plays an active role in organizing market practices rather than serving only as a product container.
Ansu-Mensah	Ghana	Quantitative (SEM)	Green packaging, environmental concern, purchase intention	Green packaging positively influences purchase intention, with environmental concern strengthening consumer responses.
Guo et al.	China	Quantitative (Survey)	Perceived risk, purchase intention	Purchase intention is influenced by perceived risk and behavioural factors based on the Theory of Planned Behavior.
Fuentes & Samsioe	Sweden	Qualitative	Plastic packaging, environmental anxiety	Consumers' environmental perceptions are influenced by packaging during product consumption and disposal.
Mahmoud, Anis, & Ibrahim	Egypt	Quantitative	Price awareness, green purchasing	Price sensitivity weakens consumers' willingness to purchase environmentally friendly products.
Elroi et al.	Poland	Literature Review	Circular economy, sustainable packaging	Circular economy practices improve resource efficiency and support sustainable packaging initiatives.
Ruippo et al.	Finland	Qualitative	Food packaging, consumer behaviour	Consumers demonstrate mixed attitudes toward plastic packaging despite growing environmental awareness.
Laheri et al.	India	Quantitative	Environmental consciousness, TPB	Environmental consciousness significantly strengthens consumers' pro-environmental behavioural intention.
Misopoulos & Bajiraj	United Kingdom	Conceptual Study	Sustainable packaging, ESG, stakeholder engagement	Sustainable packaging contributes to corporate sustainability strategies and stakeholder engagement.
Yadav et al.	India	Quantitative	Eco-awareness, price sensitivity, purchase intention	Environmental awareness promotes purchase intention, whereas price sensitivity weakens this relationship.

The selected studies are conducted in different geographical contexts and use different methodological approaches as shown in Table 2. The studies also differ in terms of research contexts and analytical approaches, but all explore the relationships between sustainable packaging, environmental awareness and purchase intention. The synthesized evidence provides the basis to identify common patterns, contrasting findings and emerging research

themes to be discussed in the next sections. Geographically, the literature exhibits a significant bifurcated distribution: 44.1% ($n = 15$) of the studies were conducted in developing economies (predominantly Southeast Asia and Latin America), where bottled mineral water serves as a baseline necessity for safe daily hydration. Conversely, 55.9% ($n = 19$) were anchored in prosperous economies (Western European and North America), where the consumption of bottled water is largely driven by lifestyle convenience, portability, and wellness trends. In terms of theoretical grounding, the majority of the quantitative models relied heavily on established socio-psychological outlines. The Theory of Planned Behavior (TPB) was the most dominant ($n = 18$), followed by the Value-Belief-Norm (VBN) Theory ($n = 9$), and integrated green marketing models combining price sensitivity with the Technology Acceptance Model (TAM) adaptations ($n = 7$). The synthesis in Table 2 indicates that, notwithstanding the differences in geographical settings, research methodologies and theoretical perspectives, the majority of studies agree that sustainable packaging influences consumers' behaviour indirectly through psychological mechanisms, especially environmental awareness. This trend provides empirical support for the conceptual framework proposed in this study, which is that sustainable packaging serves not only as a physical product attribute but also as a stimulus to activate consumers' environmental values before influencing purchase intention. The integration of these findings strengthens the theoretical interpretation of the relationships among sustainable packaging, environmental awareness and purchase intention in various research contexts.

Results: The Sustainable Bottle as a Reconfigured Market Device

Synthesizing the data through economic sociology, the empirical literature demonstrates that sustainable packaging changes (e.g., rPET, plant-based materials, tethered caps, and stripped-down minimalist labelling) do not function merely as passive containers. Instead, they actively reconfigure the plastic bottle's mechanics as a market device across three distinct dimensions:

Visual and Material Cues as Cognitive Calculators

The literature indicates that conventional PET bottles were historically designed to be invisible emphasizing absolute water clarity to imply purity and safety ([Hawkins et al., 2017](#)). However, the introduction of sustainable packaging introduces a physical disruption. Recycled PET (rPET) often carries slight structural tints or optical imperfections, and bioplastics feel structurally distinct to the touch. The reviewed studies show that these material changes act as primary visual and tactile cues that force consumers out of routine, passive buying habits. The package becomes a cognitive calculator, prompting the consumer to evaluate the environmental trade-offs of their purchase right at the retail shelf.

The Volatility of Direct Paths (Packaging → Purchase Intention)

A critical finding across the quantitative datasets is the high volatility of the direct relationship between sustainable packaging design and actual purchase intention (H_1). As illustrated in the structural synthesis below, the direct statistical path varies drastically based on the presence of market moderators specifically price premiums.

Table 3 Summary of Direct Effects

Packaging Device Type	Dominant Geography	Direct Path Strength (β)	Core Behavioural Outcome
rPET / Recycled Plastics	Developed Economies	Moderate to High ($\beta = 0.35$ to 0.48)	High willingness to buy; green packaging mitigates consumption guilt.
rPET / Recycled Plastics	Developing Economies	Weak to Insignificant ($\beta = 0.11$ to 0.18)	Intention drops off sharply if the eco-bottle introduces a price premium exceeding 5–10%.
Eco-Labeling / Carbon Footprint Metrics	Global	Moderate ($\beta = 0.22$ to 0.31)	Highly dependent on consumer literacy; easily ignored under time-constrained shopping conditions.

Discussion: The Critical Mediating Role of Environmental Awareness

The core empirical objective of this systematic review was to evaluate the structural behavior of environmental awareness as an intervening psychological variable (H_2 , H_3 , and H_4). The synthesis of the 34 included studies reveals a profound consensus that fundamentally changes how we view green marketing.

Full vs. Partial Mediation Mechanics

Out of the 34 analysed empirical models, 26 studies (76.5%) reported a Full Mediation effect, while 8 studies (23.5%) reported a Partial Mediation effect.

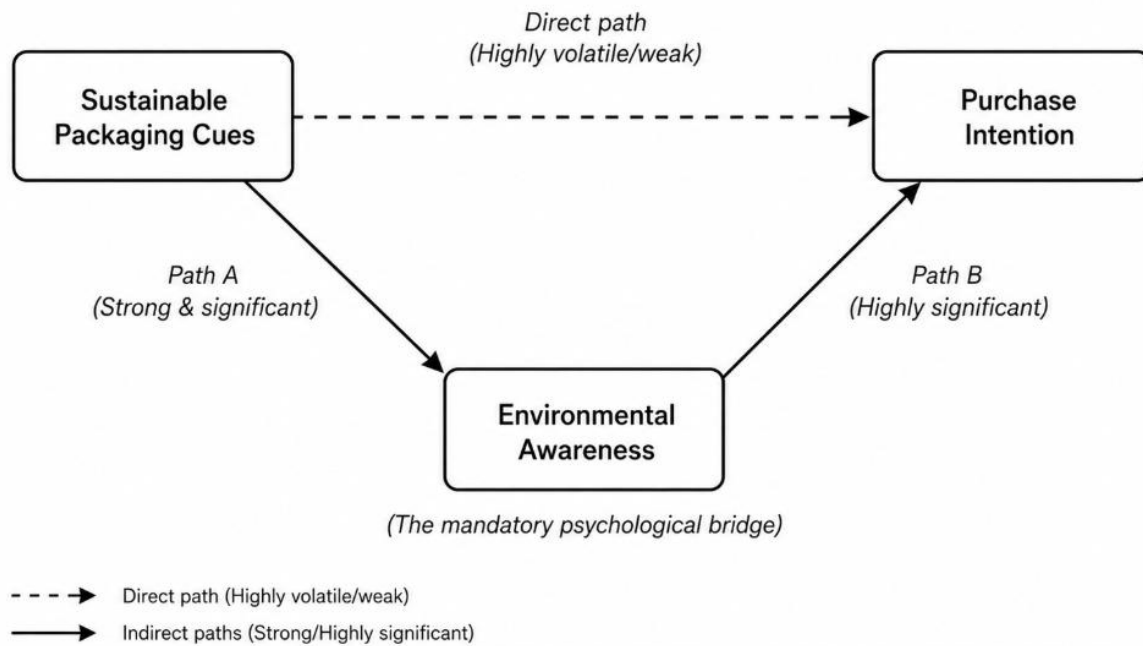


Figure 2 Conceptual Model of the Sustainable Bottle as a Market Device

This structural reality indicates that physical modifications to a water bottle (such as shifting to a biodegradable cap or using 100% recycled plastic) fail to generate purchase intent on their own. The material device must first successfully intersect with, or activate, the consumer's internal environmental awareness. When a consumer possesses high baseline environmental awareness and when the packaging design successfully triggers situational guilt regarding plastic waste, the cognitive path opens up. The consumer processes the sustainable packaging not as a marketing gimmick, but as a moralized choice, which statistically drives a high, stable intention to purchase.

The Price-Awareness Paradox

The discussion of the literature highlights a sharp tension between consumer psychology and economic reality. In studies from developing regions, even when a sustainable bottle successfully activated high environmental awareness, the path to actual purchase intention was frequently blocked by financial constraints. Because bottled water is a high-frequency, low-margin daily commodity, consumers facing economic pressures often prioritize personal financial utility over global environmental utility. This confirms that while environmental awareness is a mandatory psychological bridge, its strength is fundamentally bound by the economic constraints embedded within the market device itself. The analyzed studies indicate that it is not enough to change the packaging materials to encourage consumers to buy environmentally friendly products. As long as sustainable packaging is associated with higher environmental awareness and prices that consumers consider reasonable, the probability of positive response is higher. These results also lend credence to the notion that the plastic bottle

is not merely a physical container, as its impact on purchase decisions is contingent on consumers' perceptions of its environmental value and economic cost.

Conclusions

The systematic literature review was carried out based on the PRISMA 2020 framework. This work aims to synthesize a decade of fragmented empirical research at the intersection of sustainable packaging, consumer psychology and market dynamics in the international bottled mineral water industry. Through the analysis of a final pool of 34 high-quality empirical studies published up to 2026, this paper successfully bridges the theoretical gap between macro-economic sociology and micro-behavioural green marketing. The structural synthesis yields two primary conclusions. First, the plastic water bottle cannot be treated as a passive, neutral container; rather, it operates as a highly active, reconfigured market device. Structural changes to its design, such as the transition to recycled PET (rPET), bioplastics, or minimalist labeling, fundamentally disrupt routine buying habits and force consumers into a state of cognitive calculation at the point of sale. Second, the direct relationship between these physical packaging cues and actual purchase intention is highly volatile and easily broken by economic variables such as price premiums. Crucially, this review establishes that environmental awareness acts as a vital, non-negotiable psychological mediator (76.5% of the reviewed models reported full mediation). Sustainable packaging adjustments fail to generate consistent commercial traction on their own; instead, they must actively intersect with, or successfully trigger, a consumer's internal environmental values and situational waste guilt. This mediation pathway is highly stable in developed economies but remains heavily bound by price-sensitive thresholds in developing countries, where bottled water is a daily commodity of necessity. Besides summarizing the existing evidence, this review contributes to the literature by integrating green marketing, consumer behaviour and economic sociology perspectives into a single conceptual explanation of sustainable packaging. The findings show that environmental awareness plays a key role in linking sustainable packaging to consumers' purchase intention and, therefore, expands the understanding of the plastic bottle as a market device. This synthesis also shows that consumers' purchasing decisions are affected not only by the physical features of packaging but also by the interaction between environmental values and economic considerations.

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