



Consumer Adoption of Eco-Friendly Packaging in Developing Economies: A Review of Barriers and Breakthroughs

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Abstract

The transition to eco-friendly packaging is widely regarded as a critical lever for reducing plastic pollution and advancing sustainable consumption. While consumers in developing economies increasingly express environmental concern, their actual adoption of sustainable packaging remains limited, producing a persistent gap between attitude and behaviour. This review synthesises the scholarly literature published between 2015 and 2022 to map the principal barriers to, and breakthroughs for, consumer adoption of eco-friendly packaging in emerging-market contexts. Drawing on the Theory of Planned Behaviour and the value-attitude-behaviour framework, the review organises the evidence into four thematic strands: the economic barriers of price premiums and affordability; the cognitive and informational drivers of awareness, knowledge and certification credibility; the structural constraints of recycling and waste-management infrastructure; and the institutional and technological enablers of policy, regulation and material innovation. Three synthesis tables consolidate the determinants, the theoretical frameworks and the geographic distribution of the reviewed studies. The review finds that awareness, though necessary, is rarely the binding constraint; adoption is suppressed principally by price differentials and inadequate infrastructure, and is most effectively unlocked by innovation and supportive policy that narrow the cost gap. The review concludes that a coordinated, multi-stakeholder approach, aligning manufacturers, policymakers and retailers around price parity, credible labelling and enabling infrastructure, offers the most promising route to mainstream adoption. Directions for future research, including longitudinal designs, cross-country comparisons and behavioural experiments, are outlined.

Keywords: eco-friendly packaging; sustainable consumption; developing economies; green marketing; attitude-behaviour gap; literature review.

1. Introduction

Plastic packaging waste has become a defining environmental concern of the present era, and the search for sustainable alternatives has moved from the margins of policy debate to the centre of corporate and governmental agendas. Eco-friendly packaging, encompassing biodegradable, compostable, recyclable and reusable materials, is now promoted as a means of decoupling economic consumption from environmental harm. In developing economies, where packaged-goods consumption is expanding rapidly, the stakes are especially high, yet the pace of consumer adoption has lagged behind the growth of environmental concern. This review examines why, synthesising a decade of scholarship to identify the barriers that impede



adoption and the breakthroughs that might accelerate it. This introductory section defines the scope of the review, articulates its rationale, states its objectives and describes its organisation.

1.1 Background and Context

Packaging performs indispensable commercial functions, protecting goods, extending shelf life, conveying information and enabling distribution, yet it is also a major source of the solid waste burdening landfills and polluting waterways. Over the past decade, scientific evidence on marine plastic and microplastic contamination has intensified public scrutiny of conventional packaging, prompting manufacturers to introduce a widening range of sustainable alternatives and regulators to enact restrictions on single-use plastics. In advanced economies this shift has been reinforced by mature recycling infrastructure, extended-producer-responsibility regulation and relatively affluent consumers. In developing economies the same environmental aspirations coexist with constrained household budgets, uneven infrastructure and inconsistent regulatory enforcement, creating a distinctive adoption environment that warrants dedicated review.

1.2 Rationale for the Review

A considerable body of empirical work has accumulated on green purchasing and sustainable packaging, but it is fragmented across disciplines, geographies and constructs. Studies variously emphasise price, awareness, infrastructure, policy or innovation, often in isolation, and the specific conditions of developing economies are frequently treated as an afterthought rather than a central concern. A consolidated review is therefore needed to integrate these strands, to distinguish the determinants that consistently matter from those whose influence is contingent, and to clarify where the evidence is robust and where it remains thin. By focusing specifically on emerging-market contexts, this review addresses a gap left by literature that implicitly assumes the facilitating conditions of wealthy markets. It also responds to a practical need. Manufacturers and policymakers in developing economies confront finite resources and must decide where to concentrate effort: on educating consumers, subsidising prices, building infrastructure, tightening regulation or funding innovation. A review that clarifies the relative weight of these determinants offers a more reliable basis for such decisions than any single study, however rigorous, can provide on its own.

1.3 Objectives of the Review

The review pursues four objectives: first, to identify and categorise the principal barriers to consumer adoption of eco-friendly packaging in developing economies; second, to identify the breakthroughs, that is, the drivers and enablers most likely to accelerate adoption; third, to synthesise the theoretical frameworks that scholars have applied to explain adoption behaviour; and fourth, to derive an integrated understanding of how these determinants interact and to set out an agenda for future research.

2. Literature Review

This section synthesises the reviewed literature into four thematic strands. Each strand corresponds to a category of determinant that recurs across the studies examined, and together they provide a structured account of the barriers and breakthroughs shaping consumer adoption of eco-friendly packaging in developing economies. Three tables consolidate the evidence: a



synthesis of determinants and their reported direction of effect, a mapping of the theoretical frameworks employed, and a summary of the geographic and methodological distribution of the reviewed studies.

2.1 Economic Barriers: Price Premiums and Affordability

The most consistently reported barrier across the literature is the price premium attached to eco-friendly packaging. Nguyen, Parker, Brennan and Lockrey (2020) find that although consumers value packaging sustainability, they discount it heavily when it carries additional cost, so that affordability frequently overrides environmental preference at the point of purchase. Testa, Iraldo and Frey (2020) report that stated willingness to pay for green products routinely exceeds realised purchases, a shortfall they attribute chiefly to price sensitivity and situational constraints. Prakash and Pathak (2017), in a developing-economy setting, show that willingness to pay a premium is a significant but fragile predictor of intention, easily eroded when the premium is large. Ketelsen, Janssen and Hamm (2020), in a systematic review, identify price as one of the three decisive influences on packaging purchase intention alongside perceived environmental benefit and claim credibility. The weight of evidence indicates that in price-sensitive emerging markets, the cost differential is the single most important barrier, and that narrowing it, through scale economies, subsidies or innovation, is the most direct route to higher adoption. It is worth stressing that this barrier operates asymmetrically across income segments. For lower-income households, which form a large share of developing-economy populations, even a modest premium can be decisive, whereas for affluent consumers the same premium is often tolerable. Kumar, Prakash and Kumar (2018) show that responsible purchase intention is predictive of behaviour only when the financial sacrifice involved is perceived as reasonable, reinforcing the conclusion that price is not merely one determinant among several but a gatekeeper that conditions the influence of all the others. Where the premium is small, awareness, policy and innovation exert their full effect; where it is large, these enablers are muted.

2.2 Cognitive and Informational Drivers: Awareness, Knowledge and Certification

A second strand examines the cognitive foundations of adoption. Joshi and Rahman (2015) conclude that environmental concern translates into green purchasing only when mediated by perceived consumer effectiveness and favourable product attributes, implying that awareness alone is insufficient. White, Habib and Hardisty (2019) synthesise the behavioural evidence and argue that social influence, self-concept, feelings and cognition all shape sustainable behaviour, and that awareness campaigns succeed only when they target the specific barrier operating in a given context. On the informational side, Steenis, van Herpen, van der Lans, Ligthart and van Trijp (2017) demonstrate that consumers form sustainability judgements from packaging cues that do not always correspond to actual life-cycle impact, underscoring the risk of misperception. Magnier and Schoormans (2015) show that congruence between a product's green positioning and its packaging strengthens consumer evaluations, while Rhein and Schmid (2020) highlight the role of credible certification in converting awareness into trust. The literature converges on the view that awareness is high in many developing-economy samples but does not by itself drive adoption; credible, comprehensible labelling is needed to

bridge the gap between knowing and choosing. A recurring theme is that the quality of information matters more than its quantity. Orzan, Cruceru, Bălăceanu and Chivu (2018), in an exploratory study of consumer behaviour towards sustainable packaging, find that consumers are frequently confused by the proliferation of competing eco-labels and unverified claims, a phenomenon that breeds scepticism and greenwashing perceptions. When consumers cannot readily distinguish genuinely sustainable packaging from superficially green marketing, the informational signal that ought to drive adoption is degraded. This suggests that the informational strand is tightly coupled to the institutional strand discussed later, since credible certification depends on standards that are typically set and enforced by regulators. Awareness campaigns, in short, are most effective not when they simply raise concern, which is already high, but when they equip consumers to act on that concern by making trustworthy choices.

Table 1: Synthesis of Key Determinants of Eco-Friendly Packaging Adoption

Determinant	Category	Direction of Effect	Representative Studies
Price premium / affordability	Economic barrier	Negative (barrier)	Nguyen et al. (2020); Testa et al. (2020)
Environmental awareness	Cognitive driver	Positive (weak-moderate)	Joshi & Rahman (2015); Whelan et al. (2019)
Certification credibility	Informational driver	Positive	Steenis et al. (2017); Rhein & Schmid (2020)
Recycling infrastructure	Structural constraint	Positive (enabling)	Rhein & Schmid (2020); Popovic et al. (2019)
Government policy & regulation	Institutional enabler	Positive	Zhang & Dong (2020); Yadav & Pathak (2016)
Technological / material innovation	Technological enabler	Positive	Boesen et al. (2019); Herbes et al. (2018)

Note: Direction of effect summarises the predominant finding across the reviewed studies.

2.3 Structural Constraints: Infrastructure and Facilitating Conditions

A third strand addresses the facilitating conditions that determine whether an environmental intention can be enacted. Rhein and Schmid (2020) argue that recycling facilities and collection systems constitute enabling conditions without which favourable attitudes cannot be expressed in sustained behaviour. Popovic, Bossink and van der Sijde (2019), reviewing consumer decisions to purchase food in environmentally friendly packaging, find that the availability of disposal and recycling options materially shapes purchase behaviour. Wang, Liu and Qi (2021) demonstrate that the attitude-behaviour gap widens in emerging markets precisely because infrastructural and economic constraints intervene between intention and action, so that consumers who are willing in principle are unable in practice. Lindh, Olsson and Williams (2016) add a nuance, showing that consumer perceptions of packaging can either contribute to or counteract sustainable development depending on the surrounding waste-management

context. This body of work maps closely onto the construct of perceived behavioural control in the Theory of Planned Behaviour: where infrastructure is weak, perceived control is low, and adoption suffers regardless of attitude. Infrastructure thus functions less as a motivator than as a ceiling on how far intention can be converted into behaviour. An important implication is that infrastructure operates at both the individual and the systemic level. At the individual level, the absence of nearby recycling points or segregation facilities raises the effort cost of sustainable disposal, discouraging repeat green purchases. At the systemic level, weak collection and processing capacity means that even packaging marketed as recyclable may not in fact be recycled, undermining the environmental rationale for the premium consumers are asked to pay. This creates a credibility problem that compounds the informational barrier: consumers who suspect that eco-friendly packaging will end up in the same landfill as conventional packaging have little reason to pay more for it. Addressing infrastructure is therefore not only about enabling behaviour but about validating the environmental claims on which adoption depends, which places it at the intersection of the structural and informational strands.

Table 2: Theoretical Frameworks Applied in the Reviewed Literature

Framework	Core Proposition	Relevance to Packaging Adoption	Illustrative Studies
Theory of Planned Behaviour	Intention predicted by attitude, norms, perceived control	Infrastructure/affordability map to perceived control	Ajzen (2015); Yadav & Pathak (2016)
Value-Attitude-Behaviour hierarchy	Values shape attitudes, which drive behaviour	Links environmental values to adoption	Joshi & Rahman (2015)
Attitude-Behaviour (green) gap	Stated attitudes exceed realised behaviour	Explains willingness-action discrepancy	Testa et al. (2020); Wang et al. (2021)
SHIFT framework	Social, habit, self, feelings, tangibility drivers	Guides intervention design	White et al. (2019)

Note: Frameworks are frequently combined; several studies apply extended or hybrid models.

2.4 Institutional and Technological Enablers: Policy, Regulation and Innovation

The fourth strand turns from barriers to breakthroughs, examining the enablers that can accelerate adoption. On the institutional side, Yadav and Pathak (2016) apply an extended Theory of Planned Behaviour in a developing nation and confirm that regulatory and normative pressures add explanatory power beyond attitude alone. Zhang and Dong (2020), reviewing green consumption research, call for greater attention to contextual moderators such as policy and infrastructure that are salient in emerging markets, and note that regulation can both restrict

harmful packaging and build trust in compliant products. On the technological side, Boesen, Bey and Niero (2019) show through life-cycle assessment that material innovation can substantially reduce environmental impact, though consumer perceptions do not always track these gains. Herbes, Beuthner and Ramme (2018) find, in a cross-cultural study, that attitudes towards biobased packaging are shaped by both material properties and cultural framing, implying that innovation must be communicated as well as engineered. Norton, Waters, Oloyede and Lignou (2022) report that clearer understanding of sustainable packaging improves consumer receptivity, linking innovation to the informational strand. Collectively, this literature suggests that the most powerful breakthroughs arise where policy narrows the cost gap and innovation lowers the price and improves the performance of sustainable materials, thereby easing the economic barrier identified in the first strand. Crucially, these enablers are complementary rather than substitutable. Policy without innovation risks imposing costs that neither producers nor consumers can absorb, while innovation without supportive policy may fail to reach the market at scale. The evidence points to a virtuous circle in which regulation creates demand certainty that justifies investment in innovation, innovation lowers cost, lower cost widens adoption, and wider adoption in turn strengthens the political case for further supportive policy.

Table 3: Geographic and Methodological Distribution of Reviewed Studies

Context / Region	Dominant Method	Primary Focus	Example Studies
Developing economies (Asia)	Survey / regression	Willingness to pay, intention	Prakash & Pathak (2017); Yadav & Pathak (2016)
Emerging markets (cross-country)	Survey / review	Attitude-behaviour gap	Wang et al. (2021)
Advanced economies (Europe)	Experiment / survey	Packaging cues, perception	Steenis et al. (2017); Magnier & Schoormans (2015)
Cross-cultural / global	Systematic review	Determinants synthesis	Ketelsen et al. (2020); White et al. (2019)

Note: Several studies span multiple contexts; classification reflects the primary setting.

3. Research Methodology

This paper adopts a systematic narrative review methodology, combining the transparent, protocol-driven search of a systematic review with the interpretive synthesis characteristic of a narrative review. This hybrid approach is appropriate given the conceptual heterogeneity of the field, in which studies differ widely in their constructs, methods and geographic settings, making a purely quantitative meta-analysis impractical while still benefiting from a structured and replicable search.



The literature search was confined to peer-reviewed journal articles published between 2015 and 2022, ensuring that the review reflects the most recent decade of scholarship. Databases including Scopus, Web of Science and Google Scholar were searched using combinations of keywords such as eco-friendly packaging, sustainable packaging, green packaging, consumer adoption, purchase intention, willingness to pay, attitude-behaviour gap and developing economies. Reference lists of key articles were hand-searched to identify additional relevant sources, a technique known as backward citation tracking.

Inclusion criteria required that a study be published in the specified period, be written in English, appear in a peer-reviewed outlet, and address consumer-level determinants of eco-friendly or sustainable packaging adoption, either in a developing-economy context or in a manner generalisable to such contexts. Studies focused exclusively on industrial or business-to-business packaging, on materials science without a consumer dimension, or on non-packaging green products were excluded unless they offered directly transferable theoretical insight. The selection favoured empirical studies and systematic reviews, supplemented by seminal theoretical contributions.

The analysis proceeded thematically. Each retained study was read and coded according to the determinants it examined, the theoretical framework it applied, its geographic setting and its principal findings. These codes were then aggregated into the four thematic strands presented in the literature review and consolidated in the three synthesis tables. This thematic synthesis allows the review to identify convergent findings, reconcile apparent contradictions and expose gaps in the evidence base. The approach is transparent and replicable, though it does not eliminate the interpretive judgement inherent in narrative synthesis, a limitation acknowledged in the concluding sections.

4. Conclusion

This review set out to map the barriers and breakthroughs shaping consumer adoption of eco-friendly packaging in developing economies, drawing on a decade of scholarship. The synthesis yields a clear and consistent picture. The principal barriers are economic and structural: the price premium attached to sustainable packaging repeatedly overrides environmental preference at the point of purchase, and inadequate recycling and waste-management infrastructure prevents even willing consumers from fully enacting their intentions. Awareness, by contrast, is generally high across developing-economy samples and is rarely the binding constraint; the literature is consistent in finding that awareness is necessary but insufficient, and that its marginal returns diminish once a threshold of concern is reached. The breakthroughs lie in the interaction of institutional and technological enablers with the economic barrier. Supportive policy, through fiscal instruments, regulation and credible certification, can narrow the cost gap and build the trust needed to convert awareness into purchase. Technological and material innovation can simultaneously lower the price and improve the performance of sustainable packaging, addressing the affordability barrier at its root. The evidence points to a hierarchy of leverage in which economic and technological factors lead, informational factors such as labelling bridge the gap between attitude and choice,



and structural and institutional factors set the enabling conditions within which adoption can occur.

Two broader conclusions follow. First, the attitude-behaviour gap that dominates the green-consumption literature is, in the packaging domain, less a psychological puzzle than a reflection of real economic and structural constraints; closing it requires changing conditions, not merely changing minds. Second, no single stakeholder can deliver mainstream adoption in isolation. Manufacturers must reduce the price premium and communicate value credibly; policymakers must invest in infrastructure and deploy regulation that narrows the cost gap; and retailers must position sustainable options accessibly. A coordinated, multi-stakeholder approach aligned around price parity, credible labelling and enabling infrastructure offers the most promising route forward. In synthesising the fragmented evidence into this integrated account, the review contributes a clearer map of where effort is most likely to yield adoption.

5. Future Work

The reviewed literature, though substantial, leaves several avenues open for future inquiry. First, the predominance of cross-sectional survey designs limits causal inference; longitudinal and experimental studies are needed to establish how changes in price, infrastructure and policy causally affect adoption over time, and to distinguish durable behaviour change from transient intention. Second, much of the evidence relies on self-reported intention or behaviour, which is known to overstate actual green purchasing; future work should incorporate observed purchase data, field experiments and point-of-sale interventions to close the gap between reported and revealed preference.

Third, the developing-economy context remains under-theorised. Many studies borrow frameworks developed in affluent markets without adapting them to conditions of constrained budgets, informal retail and weak infrastructure; there is scope to develop or extend theory that treats facilitating conditions as central rather than peripheral. Fourth, comparative cross-country research within the developing world is scarce; systematic comparison across markets that differ in income, regulation and infrastructure would help identify which determinants are universal and which are context-specific. Fifth, the role of technological innovation deserves closer empirical attention, particularly studies that link specific material advances to measurable shifts in consumer adoption and cost. Finally, future reviews and meta-analyses would benefit from greater standardisation of constructs and measures, which would enable quantitative synthesis and strengthen the cumulative evidence base. Pursuing these directions would move the field from documenting the attitude-behaviour gap towards demonstrating how, in practice, it can be closed.

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