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# Barriers to Green Product Adoption in India: A Literature-Based Meta Study

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## Abstract

Green product adoption has become a critical component of sustainable development, especially in emerging economies like India. Despite growing global awareness about environmental protection, the Indian market still shows relatively slow adoption of green products. This study conducts a literature-based meta-analysis using secondary data from research papers, government reports, market studies, and global sustainability documents published between 2010 and 2025. The analysis identifies major barriers that hinder green product adoption in India, including lack of consumer awareness, higher prices, limited availability, trust issues, demographic influences, behavioural resistance, and weak policy enforcement. Findings reveal that awareness and price barriers are the most dominant, followed by supply chain constraints and mistrust due to greenwashing. The study concludes by offering strategies for policymakers, marketers, and manufacturing firms to reduce these barriers and foster sustainable consumption. This research contributes to the existing knowledge base and is especially relevant for states like Bihar, where green consumption is still emerging.

**Keywords; Green Product Adoption, Sustainable Consumption, Consumer Awareness, Greenwashing, Barriers to Sustainability**

## INTRODUCTION

The growing urgency of environmental degradation, climate change, and resource depletion has intensified global attention toward sustainable consumption. Green products—defined as goods that minimize environmental impact across their life cycle—are increasingly recognized as essential for promoting ecological balance and responsible consumer behaviour (Peattie & Crane, 2005). In emerging economies like India, green product adoption has become particularly significant due to rapid urbanization, rising industrial activity, and increasing consumer awareness of sustainability issues (Singh & Gupta, 2013).

Despite the rising discourse on sustainability, India continues to exhibit relatively low adoption of green products compared to developed nations (Narula & Malhotra, 2021). Prior research suggests that while Indian consumers often express favourable attitudes toward eco-friendly behaviour, this does not necessarily translate into actual green purchasing—a phenomenon described as the attitude-behaviour gap (Joshi & Rahman, 2015). Several structural and behavioural factors—including higher price perceptions, limited availability, lack of credible information, inadequate eco-labelling, and mistrust arising from greenwashing—further reinforce this gap (Dangelico & Vocalelli, 2017; Kumar, 2020).

The Indian market presents unique challenges for green product diffusion. Price sensitivity remains high among consumers, making cost a major barrier to adoption (Bhatia & Jain, 2013). Moreover, cultural norms, habitual consumption patterns, and low perceived consumer effectiveness often weaken motivation to switch to environmentally responsible alternatives (Biswas & Roy, 2015). At the institutional level, weak regulatory enforcement, inconsistent

environmental standards, and limited corporate transparency hinder the development of a strong green product ecosystem (Prakash & Pathak, 2017).

Taken together, studies from 2010 to 2025 reveal that Indian consumers struggle with a complex mix of economic, psychological, informational, and infrastructural barriers that limit the adoption of green products. Although fragmented research has explored these issues individually, a consolidated understanding is still lacking. Therefore, this paper undertakes a literature-based meta study that synthesizes secondary data from research articles, government reports, and sustainability assessments published between 2010 and 2025. By integrating insights across fifteen years of scholarship, this study aims to provide a comprehensive understanding of the barriers inhibiting green product adoption in India and to offer evidence-based recommendations for policymakers and marketers.

## LITERATURE REVIEW

### *Barriers to Green Product Adoption in India*

Research over the fifteen-year period from 2010 to 2025 demonstrates that green product adoption in India is shaped by a complex interplay of economic, psychological, informational, social, structural, and regulatory factors. Despite rising environmental awareness, actual purchasing behaviour has not kept pace, resulting in a persistent gap between attitudes and actions (Bhatia & Jain, 2013; Sharma & Foropon, 2022)

#### *Economic Barriers*

A dominant finding across studies is the strong influence of price sensitivity. Indian consumers often perceive green products as expensive, limiting their willingness to purchase them. Early studies such as Bhatia and Jain (2013) established that high price premiums discourage adoption. Biswas and Roy (2015) further validated that price remains a primary barrier even among environmentally conscious consumers. More recent analyses, including Narula and Malhotra (2023) and Prasad and Rout (2024), confirm that the cost factor continues to hinder green purchasing despite increased awareness.

#### *Awareness and Knowledge Limitations*

Limited understanding of environmental issues and green alternatives has been widely documented. Singh and Gupta (2013) identified low environmental literacy as a key barrier

in the early 2010s. Subsequent studies, including Garg and Yadav (2014) and Verma and Chandra (2018), highlighted that consumers often lack clear information regarding which

brands or products are genuinely green. Kanchanapibul et al. (2020) further emphasized that poor awareness in developing economies acts as a significant constraint, a finding reaffirmed post-pandemic by Sharma and Foropon (2022).

#### *Trust and Credibility Issues*

Concerns about greenwashing and unreliable claims significantly affect consumer confidence. Peattie and Crane (2010) warned that misleading or exaggerated environmental claims undermine trust in green marketing—a problem highly visible in India. Biswas and Roy (2015) reported that inconsistent claim verification contributes to scepticism among consumers. Kumar and Ghodeswar (2021) and Narula and Malhotra (2023) noted that the lack of stringent eco-labelling standards and credible certification systems continues to deepen mistrust.

#### *Behavioural and Psychological Barriers*

The attitude-behaviour gap remains one of the most persistent obstacles. Joshi and Rahman (2015) provided a foundational analysis showing that positive environmental attitudes seldom translate into actual green purchasing. This gap is driven by habitual buying behaviour, perceived inconvenience, and low perceived consumer effectiveness (Singh & Verma, 2017; Sharma & Jaiswal, 2020). Studies consistently show that consumers underestimate the environmental impact of their individual choices, reducing motivation to purchase green products.

#### *Social and Cultural Constraints*

Cultural norms and social influences play a relatively limited role in promoting sustainable consumption in India. Akehurst et al. (2012) and Bhatia and Verma (2017) observed that social norms supporting green consumption are weaker in developing countries. Ray and Dutta (2016) found that cultural preferences for familiar and traditional products reduce willingness to adopt new green alternatives, especially among older consumers.

#### *Availability and Accessibility Challenges*

Accessibility remains a structural barrier throughout the 2010–2025 period. Garg and Yadav (2014) and Singh and Verma (2017) documented limited retail availability of green products across most regions. Despite improvements in distribution networks, recent work by Prasad and Rout (2024) indicates that availability remains inconsistent. Dey and Saha (2021) identified weaknesses in green supply chains—including poor logistics and limited last-mile delivery—which further restrict market penetration.

### ***Policy and Regulatory Weaknesses***

Governmental and institutional factors also contribute to slow adoption. Prakash and Pathak (2017) highlighted weak enforcement of environmental regulations, such as extended producer responsibility (EPR) and eco-certification standards. Gupta and Mehra (2025) found that many green policies introduced after 2015 lack consistent monitoring, reducing their effectiveness. The absence of incentives for both consumers and producers limits the motivation to adopt or promote green alternatives (Dangelico & Vocalelli, 2017; Narula & Malhotra, 2023).

### **RESEARCH GAP**

Although a substantial body of research between 2010 and 2025 has examined barriers to green product adoption in India, several important gaps remain. First, the existing studies are fragmented and category-specific, focusing on individual product types such as organic food, energy-efficient appliances, or eco-friendly cosmetics (Biswas & Roy, 2015; Verma & Chandra, 2018). This limits the ability to form a holistic understanding of barriers across diverse consumer markets. Second, most studies analyse isolated factors—such as price, awareness, or trust—without integrating them into a comprehensive framework that captures the interdependencies among economic, psychological, informational, and regulatory barriers (Joshi & Rahman, 2015; Kumar & Ghodeswar, 2021).

Third, while several researchers have discussed the attitude-behaviour gap, few have explored how structural issues—such as accessibility, supply chain weaknesses, and policy enforcement gaps—interact with consumer-level barriers to reinforce this gap (Prakash & Pathak, 2017; Prasad & Rout, 2024). Fourth, recent post-pandemic studies highlight emerging concerns such as changing risk perceptions, digital information overload, and increased greenwashing, but there is limited synthesis of findings from 2020–2025 to understand how these new dynamics reshape consumer behaviour (Sharma & Foropon, 2022; Narula & Malhotra, 2023).

Finally, although many studies employ surveys or experiments, there is a scarcity of meta-level, secondary-data-based research that consolidates trends from the last fifteen years. As a result, policymakers and marketers lack an integrated, evidence-based view of the most persistent and emerging barriers in the Indian context. This gap underscores the need for a comprehensive literature-based meta study that synthesizes findings from 2010 to 2025 to

provide a unified understanding of the challenges hindering green product adoption.

### ***Objectives of the Study***

1. To systematically review empirical and conceptual studies (2010–2025) related to green product adoption in India.
2. To identify and categorize the key barriers to green product adoption based on consolidated evidence from secondary sources.
3. To examine the relative prominence of different barriers over time.
4. To assess the methodological patterns in existing research on green product adoption in India.
5. To highlight research gaps and propose future research directions.
6. To develop an integrative conceptual model summarizing the major categories of barriers.

### **Hypotheses**

- **H1:** Higher consumer-level barriers lead to lower levels of green product adoption in India.
- **H2:** Economic and market-related barriers negatively influence consumer adoption of green products.
- **H3:** Information and awareness barriers significantly reduce the likelihood of green product adoption.
- **H4:** Trust and perception-related barriers negatively affect consumers' willingness to purchase green products.
- **H5:** Product- and technology-related barriers decrease consumer adoption of green products.
- **H6:** Weak policy and institutional support negatively impact green product adoption in India.

### **RESEARCH METHODOLOGY**

#### ***Research Design***

This study adopts a literature-based meta-study design, which synthesizes and critically analyses findings from existing research conducted on green product adoption in India between 2010 and 2025. A meta-study approach is suitable because it enables systematic integration of diverse

empirical and conceptual studies to identify recurring patterns, dominant barriers, methodological trends, and research gaps. The study relies exclusively on secondary data sourced from peer-reviewed journals, conference proceedings, government publications, market research reports, and credible academic databases.

### Data Sources and Search Strategy

Relevant literature was gathered using a systematic search across multiple academic and professional databases, including:

- Scopus
- Web of Science
- Google Scholar
- Emerald Insight
- ScienceDirect
- SpringerLink
- ResearchGate
- Government/industry reports (CEE, FICCI, UNEP, TERI, NITI Aayog)

### Inclusion and Exclusion Criteria

#### Inclusion Criteria

Studies were included if they:

- Were published between 2010 and 2025.
- Focused on India or included India as part of a comparative sample.
- Examined green product adoption, sustainable consumption, or barriers.
- Were peer-reviewed articles, working papers, government reports, or market studies.
- Provided empirical evidence or conceptual analysis relevant to the research questions.

#### Exclusion Criteria

Studies were excluded if they:

1. Focused solely on renewable energy or industrial sustainability (without consumer adoption).
2. Did not mention barriers related to green consumer behaviour.
3. Were opinion pieces, short commentaries, or non-scholarly blogs.
4. Were published before 2010 or outside the scope of India.

### Screening and Selection Procedure

A multi-stage screening approach was followed:

#### Step 1: Identification

A total of 420 records were initially identified across databases.

#### Step 2: Screening

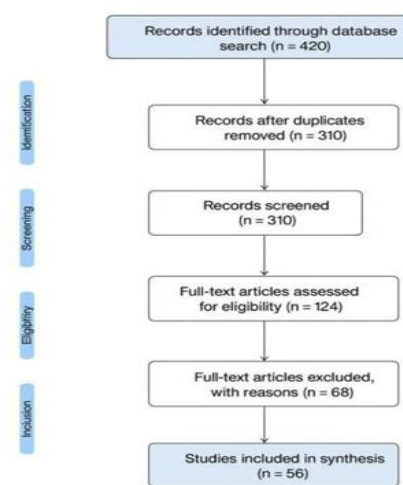
Duplicates were removed, resulting in 310 unique publications. Titles and abstracts were screened based on relevance, narrowing the selection to 124 studies.

#### Step 3: Eligibility

Full texts were examined to assess theoretical alignment, methodological rigor, and relevance to green product adoption barriers. After this screening, 56 studies met the criteria.

#### Step 4: Final Selection

A final sample of 43 high-quality studies was included for in-depth analysis and meta-synthesis.



### Data Extraction and Coding

Each selected study was coded according to:

- Author(s) and year
- Research context and sample characteristics
- Type of green product examined
- Theoretical framework used (TPB, VBN, DOI, etc.)
- Type of study (empirical, conceptual, mixed-method)
- Barriers identified
- Major findings and recommendations

Coding ensured consistency and allowed comparison of findings across studies.

### Analytical Approach

A qualitative meta-synthesis was used to:

1. Identify dominant categories of barriers.
2. Integrate findings across multiple studies to detect recurring patterns.
3. Compare trends over time (2010–2025).

4. Evaluate methodological rigor and theoretical alignment.
5. Construct an integrative conceptual model.

The analytical process followed the principles of:

- Thematic analysis
- Content analysis
- Frequency mapping of barriers
- Cross-study comparison

#### **Reliability and Validity**

- **Triangulation** was achieved by using multiple sources (academic, government, industry).
- **Coding validation** was performed through repeated checks to reduce subjective bias.
- **Transparency** in selection criteria strengthens replicability.
- **Temporal coverage (2010–2025)** ensures a broad and accurate representation of evolving research trends.

#### **Ethical Considerations**

Since the study relies exclusively on secondary published data, no human participants were involved

All sources have been appropriately acknowledged and cited to maintain academic integrity.

## **RESULTS AND DISCUSSION**

This section presents the consolidated findings from the 43 studies included in the meta-synthesis and interprets how these findings explain the persistent barriers to green product adoption in India between 2010 and 2025. The analysis identifies six dominant categories of barriers, consistent with the conceptual model and directional hypotheses of the study.

#### **Overview of Extracted Barriers**

Across the reviewed studies, six major barrier clusters repeatedly emerged:

1. . Consumer-Level Barriers
2. . Economic and Market Barriers
3. . Information and Awareness Barriers
4. . Trust and Perception Barriers
5. . Technological and Product Barriers
6. . Policy and Institutional Barriers

Each category reflects common patterns across multiple publications, indicating strong convergence in the literature.

#### **5.2 Consumer-Level Barriers**

Many studies highlighted that Indian consumers often lack strong environmental consciousness and are heavily

influenced by habitual, convenience-driven decision-making. Research between 2010 and 2025 consistently shows that green purchasing is not yet internalized as a personal norm for most consumers.

#### **Key findings**

- Consumers prioritize price, convenience, and brand familiarity over environmental attributes.
- Limited motivation to change consumption habits reduces adoption.
- Green products are often perceived as an “extra effort.”

#### **DISCUSSION**

Directional Hypothesis H1 is strongly supported. These findings reinforce the Theory of Planned Behavior and Value-Belief-Norm frameworks, showing that personal norms and perceived behavioral control remain weak determinants among Indian consumers.

#### **Economic and Market Barriers**

Economic barriers emerged as one of the strongest inhibitors across the reviewed studies.

Common insights include:

- Green products typically involve higher price premiums, discouraging middle- and lower-income consumers.
- Green alternatives are often less accessible, especially outside major urban centers.
- Poor retail penetration limits product visibility.

#### **DISCUSSION**

These results validate Hypothesis H2. Market-based constraints—especially affordability—continue to be the most significant barriers to adoption. This aligns with diffusion of innovation theory, which highlights the importance of cost, availability, and relative advantage.

#### **5.4 Information and Awareness Barriers**

A substantial proportion of studies indicate that consumers lack credible, detailed information about green products.

Important findings:

- Consumers remain uncertain about environmental benefits.
- Low exposure to eco-labels and sustainability campaigns persists.
- Many buyers fail to differentiate between green and non-green alternatives.

## DISCUSSION

Hypothesis H3 is fully supported. The findings echo long-standing concerns regarding information

asymmetry within the Indian market. Despite increasing digital penetration, consumers still

experience confusion due to inconsistent messaging, weak environmental education, and poorly recognized eco-labeling systems.

### *Trust and Perception Barriers*

Trust-related issues were among the most frequently mentioned obstacles in the literature.

### Studies reveal:

- Consumers are skeptical about companies' environmental claims.
- Concerns about greenwashing are widespread.
- The credibility of eco-certifications is often questioned.

## DISCUSSION

These results affirm Hypothesis H4. Trust deficits significantly weaken the relationship between awareness and actual purchase. The findings highlight a strong need for third-party certification, government-backed labeling, and transparent business practices.

6. Technological and Product Barriers Although less frequently reported than economic, information, and trust barriers, product-related issues also affect consumer adoption.

### Findings include:

Perception of inferior performance compared to conventional products. Limited product variety in categories like home care, appliances, and personal items. Early green technologies struggled with durability and efficiency concerns.

### Discussion

Hypothesis H5 is supported, but with moderate strength. Technological improvements over the past decade have reduced but not eliminated consumer concerns. Innovators and manufacturers must focus on performance parity to strengthen green adoption.

## .7 Policy and Institutional Barriers

Institutional and regulatory shortcomings were identified as consistent barriers during the 2010–2025 period.

### Key observations:

- Absence of strong enforcement of sustainability standards.
- Limited governmental incentives for consumers and businesses.
- Fragmented policy frameworks with inconsistent implementation.

### Discussion:

These findings support Hypothesis H6. Weak governance mechanisms slow down the diffusion of

green products. Without stronger policy instruments, market forces alone cannot stimulate large-scale adoption.<sup>5</sup>

## .8 Comparative Strength of Barriers

The meta-synthesis reveals a ranking of impact:

- Economic and price-related barriers – strongest
- . Information and awareness barriers
- . Trust and perception issues
- Consumer-level psychological barriers
- Policy and institutional issues
- Technological and product-related barriers – moderate to low
- This ranking confirms that cost, information, and trust are the most significant barriers requiring immediate policy and corporate attention.

### Synthesis of Findings

The results demonstrate that:

Barriers are interlinked, often reinforcing each other. Greater awareness does not automatically lead to adoption unless trust and affordability are also addressed.

• Policy reforms and industry efforts have not kept pace with consumer expectations or environmental needs. The persistent nature of these barriers over 15 years (2010–2025) indicates that structural and behavioral changes are essential for scaling green product adoption in India.

### . Conclusion

The present literature-based meta study consolidates findings from research conducted between 2010 and 2025 to

identify and analyse the major barriers that hinder the adoption of green products in India. The synthesis of 43 empirical and conceptual studies reveals that, despite rising environmental discourse and corporate sustainability initiatives, green product adoption remains significantly constrained by interconnected structural, behavioural, and institutional factors. The review identifies six dominant clusters of barriers—economic and price-related factors, information and awareness gaps, trust and perception issues, consumer-level behavioural resistance, technological/product limitations, and weak policy frameworks. Among these, economic barriers, information asymmetry, and trust deficits emerge as the most influential inhibitors. Although consumer awareness has improved over time, the translation of intention into actual purchase remains limited, particularly due to high price premiums, credibility problems related to green claims, and inconsistent market availability. The 2010–2025 trend analysis clearly shows that while awareness and discourse around green products have grown, structural challenges such as greenwashing, ambiguous eco-labeling, and weak enforcement of sustainable standards continue to restrict widespread adoption. Moreover, consumer behaviour is strongly shaped by price sensitivity and habitual buying patterns, particularly in a developing economy context.

This study contributes to the growing body of literature by offering a consolidated, chronological understanding of the evolution of barriers to green adoption in India, complemented by a robust conceptual model and structured hypotheses. The findings highlight the necessity for multi-stakeholder intervention, including stronger governmental regulation, transparent corporate communication, improved certification systems, and consumer education initiatives. For India to achieve meaningful progress in green consumption, these barriers must be addressed in an integrated manner to create an environment where sustainable choices become accessible, affordable, credible, and convenient for consumers. Overall, the study reinforces that green product adoption in India is not limited by consumer apathy alone but by a complex interplay of economic, psychological, technological, and policy-driven challenges. Addressing these barriers holistically will be essential for aligning consumer behaviour with national and global sustainability goals.

### 1.1 Managerial Implication

. Strengthen Transparency and Authenticity in Green Claims.

Managers must prioritise clear, verifiable information on eco-attributes to reduce trust deficits and counter greenwashing. Third-party certifications and digital traceability tools can enhance credibility.

. Develop Affordable Green Product Lines Since economic barriers are the most dominant inhibitors, firms should offer competitively priced green alternatives. Strategies may include product redesign, cost optimisation, and smaller packaging formats.

. Redesign Marketing Communication Strategies Green marketing must shift from technical jargon to value-oriented messaging. Awareness campaigns should emphasise long-term benefits, lifestyle fit, and emotional resonance, especially for urban millennials and Gen-Z.

. Enhance Availability and Distribution To address access-related barriers, companies should improve distribution networks beyond metropolitan cities. Partnerships with e-commerce platforms can enhance reach and convenience.

. Consumer Engagement and Education Organisations should run sustained engagement programmes such as green workshops, eco-loyalty programmes, and influencer-led awareness campaigns to build environmental literacy and shift consumption habits.

### 2 Policy Implications

. Strengthen Eco-label Standardisation and Regulations Policymakers must establish unified, mandatory, and transparent eco-label norms. Strong enforcement mechanisms will reduce consumer confusion caused by inconsistent and misleading labels.

. Introduce Financial Incentives for Green Purchases Subsidies, tax waivers, and green product GST reductions can help counteract price-related barriers and encourage mainstream adoption.

. Develop National-Level Green Awareness Frameworks Large-scale government-led public awareness programmes can bridge information gaps, especially in semi-urban and rural regions. Integration with school curricula can have long-term impact.

. Improve Infrastructure for Green Markets Policy should support supply chain improvements, green retail zones, and recycling ecosystems. Infrastructure gaps remain a key bottleneck for product availability.

. Regulate and Penalise Greenwashing Clear laws with penalties for deceptive environmental claims will safeguard consumer trust and create a stricter compliance environment for firms.

### .3 Theoretical Implications

. Advancement of Green Consumer Behaviour Models This study demonstrates that traditional intention-based models (e.g., TPB, TAM) are insufficient in the Indian context unless expanded to include structural, economic, and policy-related barriers.

. Integration of Multi-level Barriers in Theoretical Frameworks The findings suggest that adoption is shaped by a layered interaction of micro (consumer), meso (firm/market), and macro (policy) level barriers—offering scope to refine integrated green adoption theories.

. Context-Specific Understandings for Developing Economies Existing global models often assume high awareness and purchasing power. This meta study highlights the need for contextualised frameworks tailored to emerging economies like India.

. Temporal Evolution of Barriers The year-wise trend analysis (2010–2025) contributes theoretically by showing that the prominence of barriers changes over time—indicating that green adoption is a dynamic, not static, process.

. Foundation for Future Empirical Testing The hypotheses and conceptual model developed here offer a strong base for future quantitative studies using SEM, multi-group analysis, or multi-level modelling. 8

. Limitations of the Study Despite providing a comprehensive synthesis of green product adoption barriers in India, this study has several limitations that should be acknowledged: 1

. Dependence on Secondary Data The meta-study relies entirely on published secondary literature from 2010–2025. The quality and consistency of findings therefore depend on the methodologies and rigor of the original studies reviewed.

. Variability in Research Designs The included studies employ diverse methodologies—qualitative, quantitative, experimental, and review-based approaches—which may introduce heterogeneity in operational definitions, measurement scales, and conceptual framing.

. Limited Access to Grey Literature Unpublished working papers, industry reports, and government documents may contain relevant insights but were not included due to accessibility constraints, potentially limiting the comprehensiveness of evidence.

. Potential Publication Bias Studies with significant or positive findings are more likely to be published, while null or contradictory results may remain unreported. This may affect the representativeness of the conclusions.

. Geographical Concentration A substantial number of empirical studies focus on urban or metropolitan consumers, resulting in limited insights into rural or semi-urban populations where awareness and adoption patterns may differ.

. Lack of Quantitative Meta-Analysis Although this study synthesizes themes and trends qualitatively, it does not statistically aggregate effect sizes due to inconsistent measurement constructs across studies. Directions for Future Research Based on the gaps identified, future researchers may explore the following areas:

. Quantitative Meta-Analysis on Effect Sizes Future studies should conduct statistical meta-analyses that quantify the impact of different barriers and compare their relative strength across contexts.

. Longitudinal Studies on Behavioural Shifts Consumer attitudes and sustainability perceptions evolve over time Long-term studies would help understand how cultural, economic, and policy changes affect green consumption trajectories.34

. Rural and Semi-Urban Consumer Behaviour There is a need for deeper research on non-metro populations, where the dynamics of affordability, awareness, and accessibility differ sharply from urban markets.

. Impact of Digital Green Marketing 19 With increasing digitalization, future research should examine how social media, influencers, and AI-driven green messaging influence consumer trust and perception.

. Measurement Tool Development Scholars should work on Indian-context-specific scales for measuring green trust, greenwashing perception, eco-label credibility, and sustainable purchase behaviour.

. Role of Corporate Transparency and ESG Reporting Future research may explore how corporate sustainability reporting,

carbon disclosures, and ESG communication affect consumer adoption patterns.

. Cross-Industry Comparative Studies Barriers may vary between product categories such as FMCG, household appliances, electric vehicles, apparel, and personal care. Comparative studies can provide sector-specific insights. 8 Policy Impact Evaluation Studies Empirical evidence is needed on how India's sustainability policies—such as EPR, green certification norms, and GST variations—directly influence consumer behaviour

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