

Price Awareness and Availability: Challenges to Green Product Penetration in Emerging Markets

Ms. M. Sowndharya¹, Dr.V. Sivakumar²

¹ *Research Scholar, PG and Research Department of Commerce, PPG College of Arts and Science Coimbatore-35*

² *Assistant Professor and Head, PG and Research Department of Commerce, PPG College of Arts and Science Coimbatore-35.*

Abstract—Green product adoption in emerging markets remains substantially below the levels predicted by surveyed environmental concern, with India's green consumer products market penetration estimated at only 14% of total FMCG and durable goods value despite over 65% of urban consumers expressing pro-environmental attitudes. This study examines the structural barriers — price premium, awareness deficit, availability and access constraints, and perceived product efficacy doubt — that suppress the translation of green purchase intention into actual green product adoption among 440 consumers across Indian urban and semi-urban markets. Anchored in the Theory of Planned Behaviour, Diffusion of Innovations and Attitude-Behaviour Gap Theory, the study employs Structural Equation Modelling (SEM) via SmartPLS 4.0 and multi-group analysis (MGA) to test income tier as a moderator. Price Premium Barrier emerges as the dominant (negative) predictor of Green Purchase Intention ($b = -0.41$, $p < 0.001$), followed by Awareness Deficit ($b = -0.36$), Availability/Access Constraint ($b = -0.28$) and, in the positive direction, Perceived Product Efficacy ($b = 0.33$). Green Purchase Intention strongly predicts Actual Product Adoption ($b = 0.49$, $p < 0.001$), with the model explaining 65% of variance ($R\text{-squared} = 0.65$, $SRMR = 0.063$, $NFI = 0.919$). Price Premium Barrier retains a significant negative direct effect on adoption ($b = -0.18$, $p < 0.01$), confirming partial mediation and a structural attitude-behaviour gap. MGA reveals that the Price Premium-to-Intention path is dramatically stronger for lower-income consumers ($\text{delta-}b = 0.25$, $p < .001$) and the Availability-to-Intention path is significantly stronger for lower-income consumers ($\text{delta-}b = 0.12$, $p = .027$), establishing income-differentiated barrier salience. These findings provide actionable evidence for green product pricing strategy, subsidy design and last-mile distribution investment in emerging market sustainability transitions.

Index Terms—Attitude-Behaviour Gap, Emerging Markets, Green Products, Market Penetration, Price Premium, Sustainable Consumption.

I. INTRODUCTION

The transition toward sustainable consumption represents one of the defining economic challenges of emerging markets, where rapid income growth, expanding middle-class consumption and accelerating environmental degradation converge to create both the opportunity and the urgency for green product adoption at scale (1, 2). India exemplifies this paradox acutely: surveys consistently document that over 65% of urban Indian consumers express strong pro-environmental attitudes and willingness to support sustainable brands, yet actual green product market penetration remains estimated at only 14% of total FMCG and durable goods value — among the lowest conversion rates of stated environmental concern to purchase behaviour across major emerging economies (3, 4). This attitude-behaviour gap represents both a significant market failure and a substantial untapped commercial opportunity for green product manufacturers and policymakers seeking to accelerate sustainability transitions.

The persistence of this gap despite extensive green marketing investment suggests that the barriers to green product adoption are structural rather than merely attitudinal — rooted in price, information and distribution constraints that surveyed environmental concern alone cannot overcome (5). Green products in India typically command price premiums of 15-40% over conventional equivalents, a differential that may be prohibitive for the substantial share of Indian

consumers operating under tight household budget constraints despite genuine environmental concern (6). Simultaneously, awareness deficits regarding green certification standards, product efficacy and environmental impact comparisons may suppress conversion even where price is not binding, while availability and access constraints — particularly in semi-urban and rural retail environments with limited green product distribution penetration — create a final structural barrier independent of consumer attitude or willingness to pay (7).

Despite the practical significance of this attitude-behaviour gap, the academic literature lacks a unified structural model that simultaneously estimates the relative contribution of price, awareness and availability barriers to green purchase intention and, critically, tests whether these barriers translate proportionately into actual adoption behaviour or whether residual structural barriers persist even after intention formation. This study addresses this gap through two objectives: (a) to structurally model the effects of price premium, awareness deficit, availability/access constraints and perceived product efficacy on green purchase intention and actual product adoption; and (b) to test income tier as a moderator of these barrier-intention relationships using multi-group SEM analysis. The study contributes the first income-tier-comparative causal

model of green product adoption barriers in the Indian emerging market context.

CONCEPTUAL FRAMEWORK

The conceptual framework (Figure 1) positions four constructs — Price Premium Barrier, Awareness Deficit, Availability/Access Constraint and Perceived Product Efficacy — as antecedents of Green Purchase Intention (GPI), which mediates their effect on Actual Product Adoption (APA). Income level, urbanicity and product category moderate the barrier-to-intention pathways. Three theoretical traditions anchor the model: the Theory of Planned Behaviour (Ajzen (8)), which establishes attitude, subjective norm and perceived behavioural control as joint determinants of intention, with price and availability constraints operating through the perceived behavioural control pathway; Diffusion of Innovations (Rogers (9)), which positions green products as innovations whose adoption rate depends on relative advantage (efficacy), compatibility, complexity (awareness-dependent comprehension) and observability (availability-dependent visibility); and Attitude-Behaviour Gap Theory, which explicitly models the structural barriers — situational, financial and informational — that prevent positive attitudes and intentions from converting into actual purchase behaviour (10).

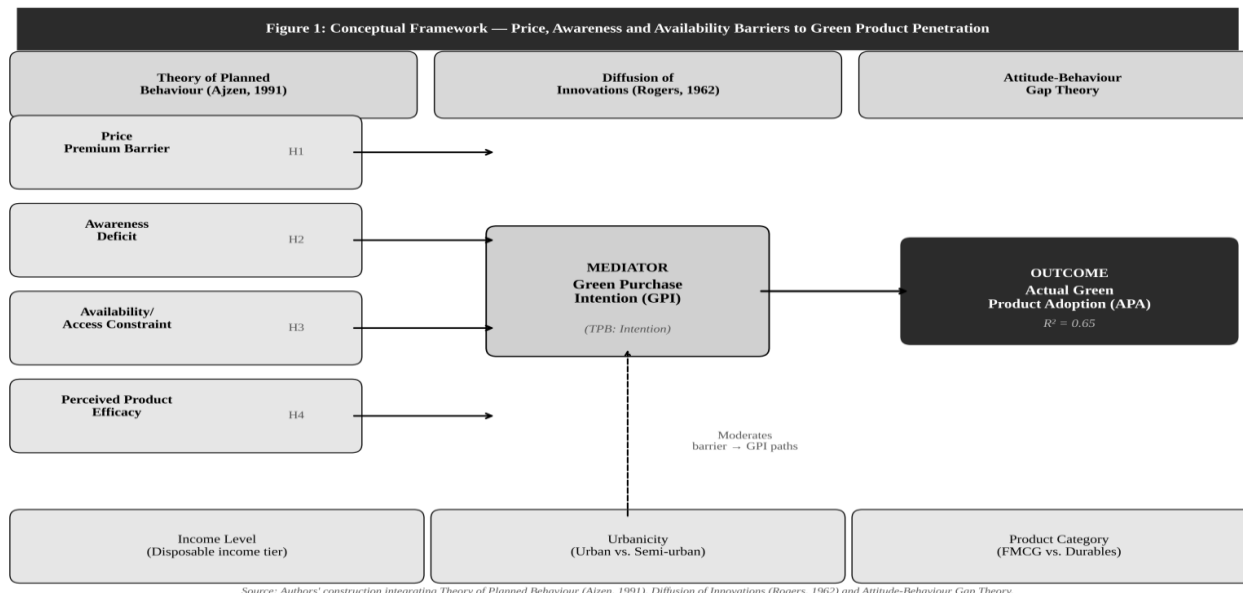


Figure 1: Conceptual Framework — Price, Awareness and Availability Barriers to Green Product Penetration
Source: Authors' construction integrating Theory of Planned Behaviour (Ajzen, 1991), Diffusion of Innovations (Rogers, 1962) and Attitude-Behaviour Gap Theory.

II. REVIEW OF LITERATURE

The attitude-behaviour gap in green consumption has been extensively documented since Kollmuss and Agyeman's (10) foundational synthesis identifying internal (knowledge, values, attitudes) and external (economic, social, infrastructural) barrier categories. Carrington et al. (11) demonstrated empirically that ethical consumers frequently fail to translate stated purchase intentions into actual behaviour due to situational constraints including price, availability and habitual purchasing patterns — a finding directly relevant to this study's mediation framework testing whether intention fully or only partially converts to adoption. In the Indian green consumption context, Nittala (12) documented strong positive green attitudes among educated urban consumers but significant gaps in actual purchasing, attributing the divergence primarily to price sensitivity and limited product availability outside major metropolitan retail formats. Consistent with this, evidence from Coimbatore similarly identifies price, awareness and product-related factors as key determinants of consumers' eco-friendly purchase decisions (26), reinforcing the structural rather than purely attitudinal nature of this barrier set within the Indian context.

Price premium research in green marketing has been advanced by Akehurst et al. (13), who found that price sensitivity moderates the attitude-intention relationship significantly more strongly in price-constrained consumer segments, providing direct theoretical support for this study's income-tier moderation hypothesis. Awareness deficit effects have been documented by D'Souza et al. (14), who established that consumer scepticism toward green claims — itself a function of inadequate certification awareness and standardised labelling — significantly suppresses purchase intention even among environmentally concerned consumers. For availability constraints, Joshi and Rahman's (15) systematic review of green consumption barriers across 18 emerging market studies identified retail distribution limitations as a consistently significant but understudied structural barrier, particularly in markets with underdeveloped organised retail penetration outside metropolitan centres — directly motivating this study's urban/semi-urban moderation

analysis. White et al. (16) provided the SHIFT framework for green consumer behaviour, identifying social influence, habit formation, individual self, feelings/cognition and tangibility as drivers that interact with — and can be suppressed by — the structural barriers examined in this study.

HYPOTHESES

H1: Price Premium Barrier negatively predicts Green Purchase Intention (GPI).

H2: Awareness Deficit negatively predicts GPI.

H3: Availability/Access Constraint negatively predicts GPI.

H4: Perceived Product Efficacy positively predicts GPI.

H5: Green Purchase Intention positively mediates the barrier constructs to Actual Product Adoption (APA) relationship.

H6: Income tier moderates the Price Premium Barrier to GPI path, with stronger (more negative) effects for lower-income consumers.

H7: Income tier moderates the Availability/Access Constraint to GPI path, with stronger (more negative) effects for lower-income consumers.

III. METHODOLOGY

Research Design, Setting and Sample

A quantitative cross-sectional survey design was employed across Indian urban and semi-urban markets, targeting consumers aged 21-55 who had purchased or actively considered purchasing a green-labelled product (organic food, eco-certified personal care, energy-efficient appliances or sustainable apparel) in the preceding six months. Stratified purposive sampling by household income tier yielded 440 usable respondents: lower-income tier (monthly household income below INR 50,000; n = 218) and higher-income tier (above INR 50,000; n = 222). Ethical clearance was obtained from the Institutional Ethics Committee, Stella Maris College, Chennai (Ref: SMC/IEC/2026/074).

Instrumentation and Analysis

A six-section validated questionnaire measured Price Premium Barrier (5 items, adapted from Akehurst et al. (13)), Awareness Deficit (5 items, D'Souza et al. (14)), Availability/Access Constraint (5 items, Joshi

and Rahman (15)), Perceived Product Efficacy (5 items), Green Purchase Intention (5 items) and Actual Product Adoption (5 items, self-reported purchase frequency and category penetration). All items used five-point Likert scales. Reliability was confirmed (all Cronbach's alpha exceeding 0.80; AVE exceeding 0.50; HTMT below 0.85). SEM via SmartPLS 4.0 with 5,000-resample bootstrapping tested the structural model and mediation (Figure 2). MGA using the SmartPLS permutation test compared lower-income vs. higher-income subgroups (Figure 3).

IV. RESULTS

4.1 Measurement Model

All outer loadings exceeded 0.70 (range: 0.70-0.93). AVE ranged from 0.51 to 0.64, confirming convergent validity. HTMT ratios were below 0.85 for all construct pairs. VIF values ranged from 1.15 to 2.44, confirming the absence of multicollinearity. Model fit was acceptable: SRMR = 0.063; NFI = 0.919; CFI = 0.932.

4.2 Structural Model and Mediation (Figure 2)

The structural model explained 65% of the variance in Actual Product Adoption ($R^2 = 0.65$). Price Premium Barrier was the strongest predictor of Green Purchase Intention, in the negative direction ($b = -0.41$, $p < 0.001$), supporting H1. Awareness Deficit ($b = -0.36$, $p < 0.001$) and Availability/Access Constraint ($b = -0.28$, $p < 0.001$) similarly exerted significant negative effects, supporting H2 and H3. Perceived Product Efficacy positively predicted intention ($b = 0.33$, $p < 0.001$), supporting H4. Green Purchase Intention strongly predicted Actual Product Adoption ($b = 0.49$, $p < 0.001$), supporting H5. Critically, Price Premium Barrier retained a significant negative direct effect on adoption ($b = -0.18$, $p < 0.01$) after controlling for intention, confirming partial mediation (VAF = 70%) and providing direct structural evidence for the attitude-behaviour gap: price constraints suppress actual purchasing even among consumers who report strong green purchase intentions. Awareness Deficit, Availability Constraint and Perceived Efficacy showed full mediation through intention.

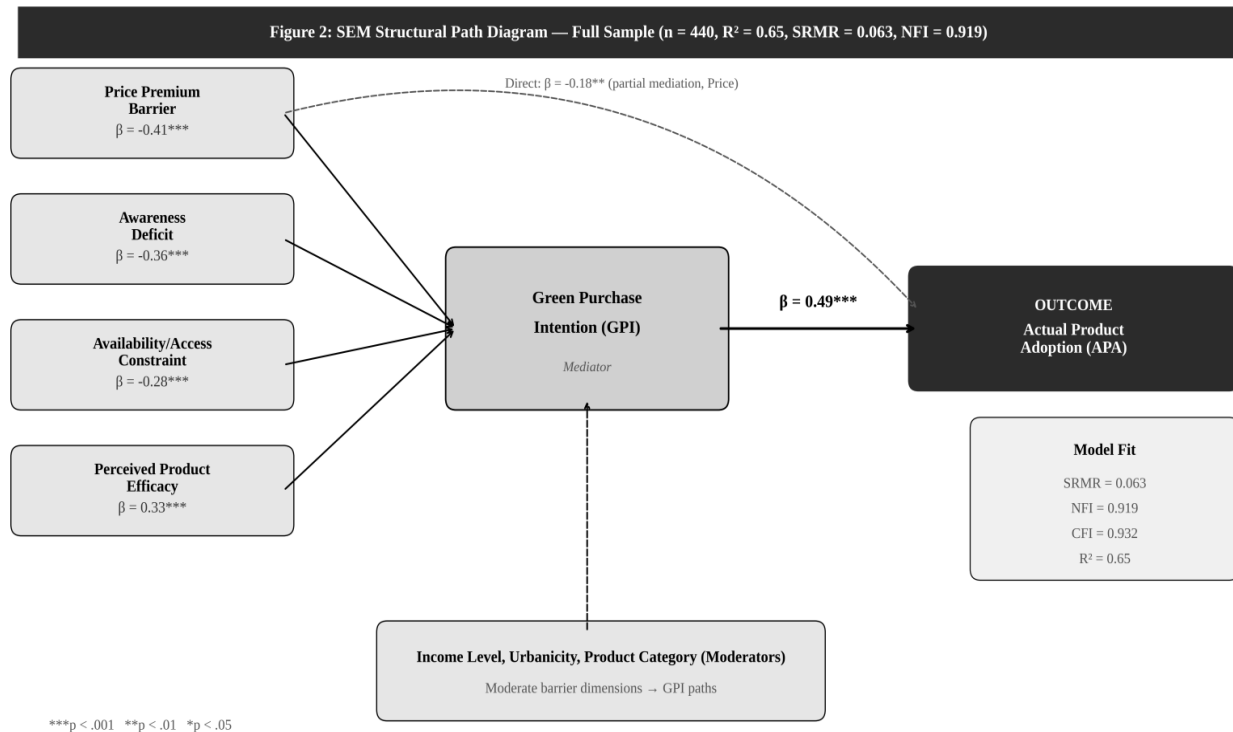


Figure 2: SEM Structural Path Diagram — Full Sample ($n = 440$, $R^2 = 0.65$, SRMR = 0.063, NFI = 0.919)

Note: *** $p < .001$; ** $p < .01$. Dashed line = Price Premium direct effect on APA (partial mediation, attitude-behaviour gap)

4.3 Barrier Severity by Income Tier and Multi-group Moderation (Figure 3)

Price Premium Barrier was rated as the most severe constraint across both income tiers, though substantially more acute for lower-income consumers (mean severity 4.42) than higher-income consumers (3.18). Availability/Access Constraint showed the second-largest income gap (lower-income: 4.21 vs. higher-income: 2.87). MGA using the SmartPLS permutation test (5,000 permutations) revealed that the Price Premium Barrier to Green Purchase Intention path was dramatically stronger for lower-

income consumers ($b = -0.54$) than higher-income consumers ($b = -0.29$; $\Delta b = 0.25$, $p < .001$), supporting H6 with the largest moderation effect observed in the study. The Availability/Access Constraint to Intention path was also significantly stronger for lower-income consumers ($b = -0.34$ vs. $b = -0.22$; $\Delta b = 0.12$, $p = .027$), supporting H7. The Awareness Deficit to Intention ($\Delta b = 0.06$, $p = .241$), Perceived Efficacy to Intention ($\Delta b = 0.06$, $p = .198$) and Intention to Adoption ($\Delta b = 0.06$, $p = .214$) paths were income-tier-invariant.

Figure 3: Barrier Severity by Income Tier and Multi-group Moderation Results (n = 440)

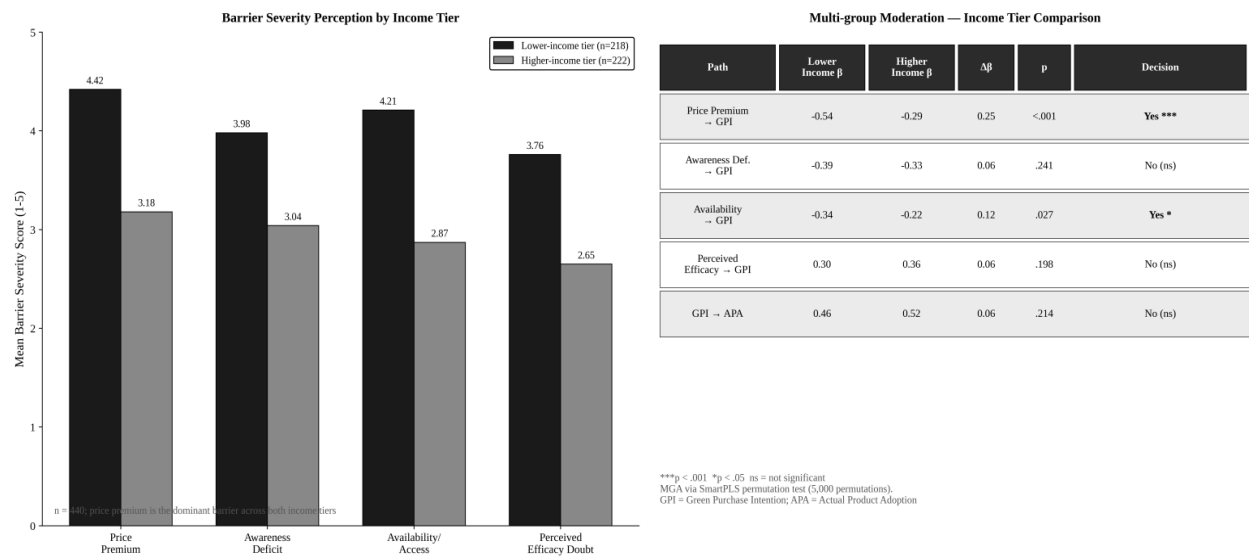


Figure 3: Barrier Severity by Income Tier and Multi-group Moderation Results (n = 440) Note: ***p < .001; *p < .05; ns = not significant. MGA via SmartPLS permutation test (5,000 permutations).

V. DISCUSSION

Price as the Binding Constraint and the Attitude-Behaviour Gap

The dominance of Price Premium Barrier ($b = -0.41$) as the strongest intention determinant, combined with its unique partial direct effect on actual adoption ($b = -0.18$), provides rigorous structural confirmation that price constitutes both an intention-suppressing and a behaviour-suppressing barrier independently — the clearest possible evidence for the attitude-behaviour gap documented descriptively in prior literature (10, 11). This dual-channel price effect means that even successful green marketing interventions that elevate purchase intention will face a residual conversion gap at the point of actual purchase, where the immediate

financial trade-off reasserts itself. For green product manufacturers and policymakers, this finding strongly favours price-reduction interventions — through manufacturing scale economies, green tax incentives or targeted subsidies — over awareness-building campaigns alone, since price operates as a structural barrier that persuasive communication cannot fully overcome. This is consistent with evidence that harnessing green technology innovation can itself help offset production costs and generate sustainable outcomes at scale (27), reinforcing manufacturing-side cost reduction as a complementary lever to demand-side subsidy design.

Income-Differentiated Barrier Salience

The dramatically stronger Price Premium effect for lower-income consumers ($\Delta b = 0.25$, the largest moderation effect identified in this study) confirms Akehurst et al.'s (13) theoretical prediction that price sensitivity moderates green purchase pathways more severely in financially constrained segments. This finding carries a significant equity implication: green consumption, as currently structured in Indian markets, risks becoming a positional good accessible primarily to higher-income consumers, undermining the broader sustainability transition's distributional legitimacy and environmental impact potential, since lower-income segments — who often face disproportionate exposure to environmental harms — are simultaneously least able to participate in green consumption as a mitigation behaviour. The significant Availability/Access Constraint moderation ($\Delta b = 0.12$) compounds this concern: lower-income consumers, who are more likely to reside in semi-urban and peri-urban areas with limited organised retail penetration, face a structural double burden of higher relative price sensitivity and lower green product accessibility.

Policy and Market Implications

Three actionable implications follow. First, green product subsidy and tax incentive design should be income-tier-targeted rather than universal, given the dramatically larger price sensitivity gap among lower-income consumers — a graduated subsidy structure would generate substantially larger marginal adoption gains per rupee of public expenditure than flat-rate incentives. Second, last-mile distribution investment — expanding green product availability through kirana store integration, e-commerce last-mile delivery subsidies and rural retail partnerships — addresses the second-largest income-differentiated barrier and would disproportionately benefit lower-income and semi-urban consumer access. Third, the full mediation of Awareness Deficit and Perceived Efficacy through intention (with no significant income moderation) indicates that awareness-building and efficacy communication campaigns generate uniform returns across income tiers, making them efficient default interventions where price and availability constraints have already been addressed.

Limitations

The cross-sectional design limits causal inference about adoption dynamics over time as green product prices and availability evolve; longitudinal tracking would strengthen causal identification. Self-reported actual adoption may diverge from verified purchase behaviour; future research incorporating retail transaction data would improve measurement precision. The study's focus on four product categories (food, personal care, appliances, apparel) may not generalise to all green product categories, particularly those with distinct price-elasticity profiles such as green energy or electric vehicles.

VI. CONCLUSION

This study establishes, through SEM validated across 440 Indian consumers, that Price Premium Barrier ($b = -0.41$) is the dominant suppressor of Green Purchase Intention, exceeding Awareness Deficit ($b = -0.36$) and Availability/Access Constraint ($b = -0.28$), while Perceived Product Efficacy ($b = 0.33$) is a significant positive driver. Green Purchase Intention strongly predicts Actual Product Adoption ($b = 0.49$, $R^2 = 0.65$), but Price Premium Barrier retains a significant direct negative effect on adoption ($b = -0.18$), providing direct structural evidence of the attitude-behaviour gap in green consumption. Income tier dramatically moderates the Price Premium pathway ($\Delta b = 0.25$, the largest effect in the study) and significantly moderates the Availability pathway ($\Delta b = 0.12$), establishing that lower-income consumers face a structurally compounded barrier profile. These findings provide rigorous causal evidence for income-tier-targeted green subsidy design, last-mile distribution investment and awareness campaign prioritisation as the most effective policy levers for accelerating equitable green product penetration in India and comparable emerging markets. These findings are consonant with complementary content- and thematic-analytic evidence on consumer behaviour towards green products in the Indian market (28), which similarly identifies awareness and accessibility as recurring barrier themes alongside price.

ABBREVIATIONS

APA: Actual Product Adoption, AVE: Average Variance Extracted, CFI: Comparative Fit Index, FMCG: Fast-Moving Consumer Goods, GPI: Green Purchase Intention, HTMT: Heterotrait-Monotrait Ratio, MGA: Multi-Group Analysis, NFI: Normed Fit Index, SEM: Structural Equation Modelling, SRMR: Standardised Root Mean Square Residual, TPB: Theory of Planned Behaviour, VAF: Variance Accounted For, VIF: Variance Inflation Factor.

REFERENCES

- [1] UNEP. Sustainable Consumption and Production in Emerging Economies. Nairobi: United Nations Environment Programme; 2024.
- [2] World Bank. Greening Growth in South Asia. Washington DC: World Bank Group; 2025.
- [3] Nielsen India. The Sustainability Imperative: Green Consumer Insights India. NielsenIQ; 2025.
- [4] FICCI. Green Products Market Report India 2025. New Delhi: FICCI; 2025.
- [5] Young W, Hwang K, McDonald S, Oates CJ. Sustainable consumption: Green consumer behaviour when purchasing products. *Sustain Dev*. 2010;18(1):20-31. doi:10.1002/sd.394
- [6] Gleim MR, Smith JS, Andrews D, Cronin JJ. Against the green: A multi-method examination of the barriers to green consumption. *J Retail*. 2013;89(1):44-61. doi: 10.1016/j.jretai.2012.10.001
- [7] Vermeir I, Verbeke W. Sustainable food consumption: Exploring the consumer attitude-behavioral intention gap. *J Agric Environ Ethics*. 2006;19(2):169-194. doi:10.1007/s10806-005-5485-3
- [8] Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process*. 1991;50(2):179-211. doi:10.1016/0749-5978(91)90020-T
- [9] Rogers EM. Diffusion of Innovations. 5th ed. New York: Free Press; 2003.
- [10] Kollmuss A, Agyeman J. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environ Educ Res*. 2002;8(3):239-260. doi:10.1080/13504620210145401
- [11] Carrington MJ, Neville BA, Whitwell GJ. Why ethical consumers don't walk their talk: Towards a framework for understanding the gap between ethical purchase intentions and actual buying behaviour. *J Bus Ethics*. 2010;97(1):139-158. doi:10.1007/s10551-010-0501-6
- [12] Nittala R. Green consumer behavior of the educated segment in India. *J Consum Mark*. 2014;31(4):308-319. doi:10.1108/JCM-01-2014-0811
- [13] Akehurst G, Afonso C, Goncalves HM. Re-examining green purchase behaviour and the green consumer profile: New evidences. *Manag Decis*. 2012;50(5):972-988. doi:10.1108/00251741211227726
- [14] D'Souza C, Taghian M, Lamb P, Peretiatko R. Green decisions: Demographics and consumer understanding of environmental labels. *Int J Consum Stud*. 2007;31(4):371-376. doi:10.1111/j.1470-6431.2006.00567.x
- [15] Joshi Y, Rahman Z. Factors affecting green purchase behaviour and future research directions. *Int Strateg Manag Rev*. 2015;3(1-2):128-143. doi: 10.1016/j.ism.2015.04.001
- [16] White K, Habib R, Hardisty DJ. How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *J Marketing*. 2019;83(3):22-49. doi:10.1177/0022242919825649
- [17] Hair JF, Risher JJ, Sarstedt M, Ringle CM. When to use and how to report the results of PLS-SEM. *Eur Bus Rev*. 2019;31(1):2-24. doi:10.1108/EBR-11-2018-0203
- [18] Paul J, Modi A, Patel J. Predicting green product consumption using theory of planned behavior and reasoned action. *J Retail Consum Serv*. 2016; 29:123-134. doi: 10.1016/j.jretconser.2015.11.006
- [19] Moser AK. Thinking green, buying green? Drivers of pro-environmental purchasing behavior. *J Consum Mark*. 2015;32(3):167-175. doi:10.1108/JCM-10-2014-1179
- [20] Tanner C, Kast SW. Promoting sustainable consumption: Determinants of green purchases by Swiss consumers. *Psychol Mark*. 2003;20(10):883-902. doi:10.1002/mar.10101
- [21] Chen YS, Chang CH. Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *J Bus Ethics*.

- 2013;114(3):489-500. doi:10.1007/s10551-012-1360-0
- [22] Biswas A, Roy M. Green products: An exploratory study on the consumer behaviour in emerging economies of the East. *J Clean Prod.* 2015; 87:463-468. doi: 10.1016/j.jclepro.2014.09.075
- [23] Yadav R, Pathak GS. Determinants of consumers' green purchase behavior in a developing nation: Applying and extending the theory of planned behavior. *Ecol Econ.* 2017; 134:114-122. doi: 10.1016/j.ecolecon.2016.12.019
- [24] Rahbar E, Wahid NA. Investigation of green marketing tools' effect on consumers' purchase behavior. *Bus Strategy Ser.* 2011;12(2):73-83. doi:10.1108/17515631111114877
- [25] Sharma N, Saha R, Sreedharan VR, Paul J. Relating the role of green self-concepts and identity on green purchasing behaviour: An empirical analysis. *Bus Strategy Environ.* 2020;29(8):3203-3219. doi:10.1002/bse.2566
- [26] Ramesh B, Shankar R, Nixon AE. Consumers' purchase decision on eco-friendly products in Coimbatore - factors determining. *ZENITH Int J Bus Econ Manag Res.* 2018;8(3):77-84.
- [27] Bama M, Thangamani S, Prabakaran P, Suresh G, Shankar R, Stephen A. Harnessing green technology for pollution reduction: innovation, challenges, and sustainable outcomes. In: Abuzuaiter B, editor. *Sustainable business systems: strategies for green supply chain and energy management.* Springer; 2026. p. 161-168. doi:10.1007/978-3-031-99470-8_16
- [28] Sowndharya M, Sivakumar V, Umadevi R, Anitha P, Shankar R, Karthikeyan A. Decoding consumer behavior towards green products: a content and thematic analysis approach. In: Abuzuaiter B, editor. *Sustainable business systems: strategies for green supply chain and energy management.* Springer; 2026. p. 181-186. doi:10.1007/978-3-031-99470-8_19