

# Exploring the Alignment Between Consumer Expectations and Retailer Strategies for Sustainable Practices in Indian Supermarkets

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**ABSTRACT** Sustainability has gradually become vital in the present retail food processing industry strategy, particularly within food distribution systems. Although sustainability in retail has received considerable research attention, existing research largely focuses on metropolitan markets. Whereas Tier-3 cities, despite contributing a significant share of emerging market retail growth, remain comparatively low in the research section. The research contributes empirical evidence from a Tier-3 Indian retail context, addressing geographical bias in sustainability literature. This study investigates sustainability practices implemented in supermarkets operating in the tier-3 cities of the Rayalaseema region, A.P., in India, from dual perspectives of owners/managers and consumers. By addressing the geographical imbalance in sustainability research, the findings provide insights relevant to practical policy for advancing sustainable retail ecosystems in emerging markets.

A survey was conducted among a sample of 270 customers and 112 supermarket managers using a well-structured questionnaire. The results of the study indicate that consumers hold a favourable perception of ethical product availability and pricing fairness, moderate eco-initiatives. From the managerial perspective, plastic reduction policies and eco-friendly packaging are widely implemented, whereas renewable energy adoption and structured local sourcing remain limited. The outcome of the Inferential statistical analysis reveals a significant positive association between sustainability practices and ethical perception. However, the chi-square test revealed no significant relationship between stated motivation for reusable bag use and actual usage frequency, nor between plastic policy strength and adoption challenges stemming from many awareness gaps. The investigation suggests resolving an attitude-behaviour gap and raising awareness of the availability of sustainable products and practices. Policy and managerial implications highlight the need for AI-driven waste forecasting, solar energy subsidies, enhanced eco-labelling, and strengthened local supply networks.

**Keywords:** Sustainability, Supermarkets, Eco Retail initiatives, Tier-3 Cities, Consumer Perception, Waste Management, India.

## 1. Introduction

Over the past three decades, sustainability has evolved from an ethical consideration into a strategic imperative across industries. Within retail systems, particularly food distribution networks, sustainability now interconnects with operational efficiency, brand positioning, regulatory compliance, and stakeholder engagement. Supermarkets occupy a central role in shaping supply chain practices and influencing consumer behaviour. Their decisions regarding plastic use, packaging, sourcing, waste management, and energy use have become comprehensive in terms of environmental and social implications. The implementation of sustainable practices within Indian supermarkets is a critical area of research, reflecting both

global environmental concerns and the unique dynamics of India's rapidly evolving retail sector. This study encompasses a broad range of efforts, from energy efficiency and waste management to ethical sourcing and supply chain sustainability.

According to the World Commission on Environment and Development (1987), Sustainability refers to “development that meets present needs without compromising future generations’ ability to meet theirs”. In the retail sector, sustainability encompasses environmental stewardship, economic viability, and social equity within supply chains and distribution systems. In India, organised retail has expanded rapidly beyond metropolitan regions into smaller cities. While research has extensively explored sustainability in Tier-1 urban centres, semi-urban and Tier-3 cities remain underrepresented in empirical investigation. These markets present distinct structural characteristics: proximity to agricultural production, evolving consumer awareness, infrastructural constraints, and resource limitations. Understanding sustainability within such contexts is therefore critical for a more balanced representation of emerging market realities.

Indian supermarkets account for nearly 70% of organised urban food retail and significantly influence: Plastic waste generation (approximately 3.5 million tons annually), Food wastage (estimated 40% of produce), commercial energy consumption (around 15% of the sector).

Metropolitan cities highly adopt the sustainability discourse, whereas more than 65% of the Indian retail market’s sustainability practices are adopted by supermarkets in Tier-3 cities of the Rayalseema region (Kadapa, Kurnool, Chittoor, Ananthapur) located in the state of Andhra Pradesh, which represent a typical Tier-3 urban setting with growing supermarket penetration, and remain underexplored in empirical research in Andhra Pradesh. The economic structure combines agricultural dependence with increasing retail modernisation. However, limited cold-chain infrastructure, constrained capital availability, and moderate environmental awareness pose challenges for sustainability integration.

## **2. Review of literature:**

The extensive literature survey on sustainability and performance in the retail sector provides a comprehensive foundation for understanding supermarket operations from multiple dimensions. An extensive review highlights key energy-efficiency strategies, focusing on energy use intensity, HVAC performance, lighting-related KPIs, and CO<sub>2</sub> emission proxies, all of which are highly relevant to supermarket environments [1]. In the Indian context, research on sustainable packaging demonstrates its significant role in improving supply chain efficiency through cost reduction, lead-time optimisation, and better resource utilisation [2]. At the same time, studies on e-commerce plastic waste further propose cleaner production solutions to mitigate environmental impact [8]. Consumer-centric investigations reveal evolving purchasing behaviour, with evidence from Tirunelveli indicating that adaptive retail strategies are crucial in a dynamic market scenario [3]. Additionally, sustainability practices in organized retail have been found to positively influence impulse buying by enhancing brand image and customer loyalty [4], a finding further reinforced by empirical results showing a significant relationship between sustainability initiatives and impulse purchases ( $\beta = 0.42$ ,  $p < 0.01$ ). Parallely, the rapid digital transformation of the Indian e-grocery sector has reshaped consumer behaviour, shifting from traditional to technology-driven platforms [5]. From an organizational and financial perspective, studies on the FMCG sector, particularly through case analysis of Hindustan Unilever Limited, underline the importance of financial performance assessment using secondary data [6], while broader analyses emphasize the revolutionary growth and potential of organized retailing in India [7]. Supply chain sustainability also emerges as a critical theme, with research developing group decision-making models for sustainable supplier evaluation in agro-food systems [9], and

further evidence highlighting the social sustainability challenges faced by micro, small, and medium suppliers in India [12]. Advanced decision-making approaches such as Fuzzy TOPSIS have been validated for green supplier selection with high classification accuracy (92%), underscoring the importance of structured evaluation frameworks [13]. Moreover, international evidence from Italian supermarkets demonstrates the effectiveness of sustainable food waste management practices, revealing that consumers are willing to purchase near-expiry products at discounted prices, thereby addressing both food insecurity and environmental concerns [10]. Consumer behaviour is also shaped by corporate responsibility initiatives, where support for local producers enhances retailer legitimacy and purchase intentions [11]. Recent advancements further indicate that AI-enabled green intelligence models significantly improve marketing effectiveness ( $R^2 = 0.67$ ), highlighting the growing role of technology in sustainability strategies. Overall, the literature consistently identifies key retail sustainability priorities, including eco-friendly packaging, renewable energy adoption, green logistics, efficient supply chain management, and consumer awareness initiatives, as essential drivers of long-term competitiveness and environmental responsibility in the retail sector [14].

### 3. Research Questions

The economic structure of these cities combines agricultural dependence with increasing retail modernisation. However, limited cold-chain infrastructure, constrained capital availability, and moderate environmental awareness pose challenges for the integration of sustainability. By examining both managerial practices and consumer responses, this research offers a comprehensive perspective on sustainable retail transformation in semi-urban regions of India. The research questions are:

- How do supermarkets located in Tier 3 cities of the Royal Seema region, AP, implement sustainable practices?
- How do consumers perceive these practices?
- What factors hinder or facilitate their effective adoption?
- Are the practices implemented by supermarkets aligned with consumers' expectations?

### 4. Need for the Study

In the present scenario, Indian consumers are knowledgeable and prefer sustainable brands (Nielsen, 2023). Concurrently, regulatory authorities mandate the Plastic Waste Management Rules, 2016 (amended 2022), impose stringent obligations on retailers to curtail the use of plastics, aligning with broader national sustainability goals (Ministry of Environment, Forest and Climate Change, 2022). The other drivers, such as the increasing climate vulnerabilities - manifested in erratic monsoons and heatwaves and inefficient food systems in semi-urban areas of India, are forcing the adoption of sustainability. Supermarkets in Tier-3 cities face acute challenges, including spoiling of product among perishable goods, insufficient cold storage infrastructure and pervasive dependence on plastic packaging. While localised sourcing mitigates transport emissions by up to 35%, persistent issues in supply quality and continuity impede scalable implementation. Hence, this research is conducted to bridge a critical gap in empirical evidence by synthesising customer and managerial insights through rigorous, statistically validated methodologies.

### 5. Objectives of the Study

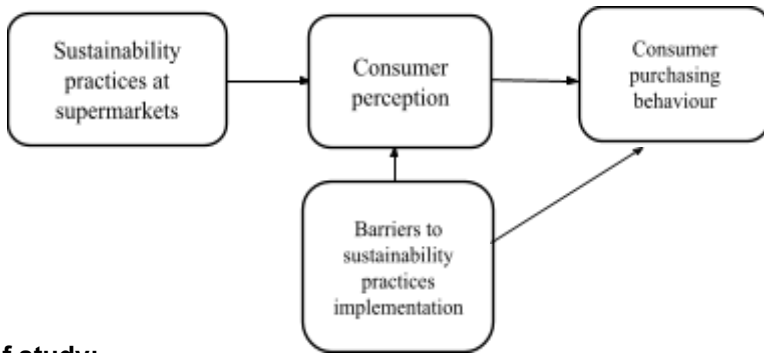
- To examine sustainable practices, consumer perceptions, and adoption barriers at Tier -3 Supermarkets.
- To evaluate alignment between practices adopted and consumer perceptions.

### 6. Research hypothesis:

- $H_1$ : Sustainability practices positively influence customers' perception.
- $H_2$ : Customer perception significantly influences customer purchasing

- **H<sub>3</sub>**: Sustainability barriers significantly influence the customer perception and customer purchasing behaviour.

## 7. Research Model:



### Variables of study:

The supermarkets' sustainability practices are measured with parameters such as Plastic reduction policy, Sustainable sourcing (Local farmers, producers), Adequate cold storage, sustainable packing (reusable / recycling packing: biodegradable/reusable containers, refillable / cloth/cotton / Nylon / Jute / Paper bags), Encourage the customers to carry their own bag, waste management (Perishable goods / unsold (vegetables/fruits/diary): Discounted sales, Disposal, return to suppliers, Donation, Reuse), Energy Efficiency (Solar panels for energy, reduced energy for refrigeration, LED lightening), Encourage customers to get own carry bag).

- The consumer's perception is measured with the variables: Ethical products availability, Fair pricing for products, implementation of Modern Eco-friendly initiatives (products, reusable bags provision, and supermarkets' encouragement for own carry bag (social responsibility, avoid extra charges, quality, habit, peer influence, convenient), local sourcing, less cold stored products and reusable bags provision, avoid extra charges) and Motivation to sustainable products (Brand image, Quality, Social responsibility, environment protection).
- The customers' purchasing behaviour is measured with Organic buying (products: Freshness, quality, price, brand, discount), Own carry bags use, reusable bag purchase, and frequency of purchase.
- The barriers to implementing sustainable practices are measured through low availability of sustainable products, lack of trust, high price, lack of awareness, customer resistance, and preference to familiar products.
- The research is based on the Theory of Planned Attitude and the Theory of Planned Behaviour, where behaviour is led by attitude. These theories facilitate verifying the gap between attitude and actual behaviour. The theories are adopted to measure the attitude of customers towards the implemented sustainable practices at supermarkets and their purchasing behaviour based on the framed attitude.

## 8. Research Methodology:

**8.1. Research Design:** The study describes the sustainability practices implemented at selected supermarkets, in the tier-3 cities of the Royalseema region, Andhra Pradesh, and the perception as well as purchasing behavioural patterns of customers. The research examines the influence of sustainability practices on the consumers' attitude and behaviour. The study also evaluates the influence of barriers of sustainability on consumers' perception and purchase behaviour. A pilot survey is conducted to identify

customers' perceptual factors through qualitative interviews with a few customers, and later, the factors are converted into quantitative variables to conduct the research. Hence, the present research is a quantitative survey approach with a descriptive cum analytical design.

**8.2. Sampling design:** A purposive sample of 270 customers and 112 owners of selected non-branded supermarkets from busy areas of the concerned cities is considered for the study. The researcher approached 170 supermarket owners and 539 customers, out of whom 112 owners (65.9%) and 270 (54%) customers willingly participated in the survey. The researcher tried to survey the customers of the concerned supermarkets during the peak hours of shopping to reduce the bias and increase the chances of a larger sample size. The research is based on both primary and secondary data.

**8.3. Research Instrument:** A well-structured questionnaire was administered individually to both supermarket owners and customers on the designed variables suitable for the sample units to collect the primary data. The individualised research instrument (owners & customers) was prepared with closed-ended questions. The owners' instrument consists of 2 sub-sections: Section I deals with the demographic profile, and Section II contains items on the sustainability practices adopted at their stores.

The instrument for customers also consists of 4 parts: Part A contains items on D consists of perceived barriers to sustainability implementation.

**8.4. Statistical tools:** The primary data is analysed using Descriptive statistics (Mean, Standard Deviation), Associational statistics (Bivariate Correlation and Simple linear regression analysis) with IBM SPSS V. 21.

**9. Results and Discussion:**

The total number of owner respondents of the present survey is 112, of whom 37 are female, and 75 are male.

9.1. Below analysis represents the demographic profile of sample elements.

Table 1: Supermarket Owners' Demographic Profile:

Variable	values	Male (75)	Female (37)	Total
Age group	Less than 30 Yrs	17	17	34
	30 to 45 Yrs	28	13	41
	45 to 60 Yrs	27	5	32
	above 60 Yrs	3	2	5
Education	Illiterate	5	5	10
	High School	12	4	16
	Graduate	43	16	59
	Postgraduate	15	12	27
Business experience	less than 5 years	16	4	20
	5 to 10 years	23	11	34
	10 to 20 yrs	28	16	44
	above 20Yrs	8	6	14

Source: Field analysis

Table 2: Demographic profile of customers

The total number of customer respondents of the present survey is 270, 180 are female, and 90 are male.

Variable	values	Female (180)	Male (90)	Total
Age group	15 to 25 Yrs	26	19	45
	25 to 35 Yrs	35	25	60
	35 to 45 Yrs	42	20	62
	45 to 55 Yrs	32	15	47

	Above 55 Yrs	45	11	56
<b>Education</b>	Illiterate	22	2	24
	High School	22	20	42
	Graduate	87	43	130
	Postgraduate	49	25	74
<b>Income</b>	less than 25K	33	18	51
	25K to 45K	68	35	103
	45K to 65 yrs	50	27	77
	above 65K	29	10	39
<b>Occupation</b>	Employed	49	32	81
	Self-employed	21	15	36
	Housewife	70	0	70
	Student	23	12	35
	Retired	17	31	48

Source: Field analysis

Table 3: Assessment of Sustainability practices adopted by supermarkets

<b>Variable</b>	<b>Items</b>	<b>Mean</b>	<b>S.D</b>
Plastic reduction	Plastic reduction policy	3.74	0.62
Sustainable sourcing	From Local farmers	3.89	0.76
	From local producers	3.91	0.61
sustainable packing (reusable / recycling packing)	Biodegradable	3.88	0.89
	Reusable containers	3.93	0.82
	Refillable containers	3.93	0.74
	Cloth/cotton bags	4.53	0.62
	Nylon foldable bags	3.97	0.77
	Jute bags	4.62	0.66
	Paper bags	3.92	0.77
waste management of Perishable goods / unsold (vegetables/fruits/diary)	Discounts	4.68	0.75
	Donations	3.93	0.73
	Disposing via Compost / natural fertilizer bins	3.97	0.76
	Return to suppliers	3.87	0.92
	Reuse	3.88	0.79
Products / groceries with expiry date near by	Discount	4.68	0.67
	Return to suppliers	3.99	0.69
	Eco-friendly Disposal	3.86	0.88
Energy Efficiency	Use of Solar Energy	3.19	0.64
	Reduced energy for refrigeration	3.20	0.83
	LED lightening	3.28	0.94
Encourage the customers to carry their own bag	-	4.69	0.41
Adequate cold storage	-	3.88	0.63

Source: Field analysis

The results of descriptive analysis depict the pragmatic and positive scores for the implementation of sustainable practices by supermarket owners in tier 3 cities. Highest score (> 4.5) for encouraging the customers to get their own bags and discounts offered for the perishable goods with expiry dates nearby shows the quick ROI generation by the owners. The rest of the sustainable practices are being implemented by the supermarkets at aggregable level shows their

environmental concern. Low scores have been identified for the use of solar energy, LED lighting, and energy use for refrigeration, representing the energy efficiency levels are moderate.

Table 4: Customer Perception on Existing Sustainable Practices

Variable	Items	Mean	S.D
Implementation of Modern Eco-friendly initiatives	Organic products availability	4.05	0.68
	Reusable bags provision	4.12	0.62
Getting own carry bag	Social responsibility	3.85	0.79
	avoid extra charges for reusable bag	4.25	0.55
	To maintain quality	4.18	0.70
	Habit	4.32	0.62
	Peer influence	3.45	0.32
	convenient	3.92	0.55
	Environment Protection	3.78	0.68
Motivation to sustainable products	Brand image	4.28	0.51
	Quality	3.95	0.72
	Social responsibility	4.15	0.75
	environment protection	4.22	0.69
Preference to reusable / recyclable bags	biodegradable	4.34	0.73
	Reusable containers	4.08	0.76
	Refillable containers	3.92	0.54
	Cloth / Cotton bags	3.88	0.87
	Nylon foldable bags	4.35	0.67
	Jute bags	3.75	0.9
	Paper bags	4.42	0.66
	Others	3.98	0.61
Ethical products availability	-	3.65	0.95
Fair pricing for products	-	4.1	0.87
Less cold stored products	-	3.88	0.85
Local sourcing	-	4.18	0.74

Source: Field analysis

According to the descriptive results from the table 4, on customer’s perception towards the sustainable practices implemented by supermarkets, high mean score (> 4.2) reveals the concern of consumers for environment protection, quality maintenance, preference for biodegradable bags /jute bags, and carrying their own bag as their social responsibility, indicating strong support among customers associated with increasing sustainability awareness in AP tier-3 markets. Lower / moderate level mean scores for habit, others, and convenience of carrying their own bag during shopping shows their behavioral inertia. There is an attitude - behavior conflict due to high eco-motivation, but moderate adoption drivers may be attributed to low awareness.

Table 5: Customer Purchasing Behaviour

Variable	Items	Mean	S.D
Purchase Frequency	Daily	4.55	0.62
	Weekly	4.35	0.58
	Monthly	3.92	0.79
	Rarely	3.45	0.96
Purchase sustainable products those with	Freshness	4.52	0.42
	Quality,	4.48	0.65
	Price,	4.22	0.75

	Brand,	3.88	0.74
	Discount	4.75	0.55
Purchase of organic products	-	3.76	0.87
Own carry bags use	-	4.47	0.67
Purchase Reusable bag	-	4.19	0.53
Purchase Perishable Goods Near to expiry date at	Discounted price	4.76	0.52
	Freely offered	3.43	0.88

Source: Field analysis

The results from descriptive analysis of customers’ sustainable purchasing behaviour are displayed in Table 5. The results indicate strong endorsement (> 4.5) for discount-driven behaviours like near-expiry perishables and freshness/quality purchases, reflecting revenue strategies amid tier-3 constraints like Kadapa's supply chains. Weekly purchases and own-bag use also score high, aligning with customer encouragement practices from prior owner data. Lower means (~3.8) emerge for freely offered expiry items and rare purchases, indicating cost sensitivity.

These results highlight pragmatic owner optimism: discount mechanisms bridge sustainability with profitability (low SD <0.6), supporting H1 practice-perception links, while free offerings lag due to margins in AP tier-3 economics. Reusable bag sales with expiry discounts to elevate overall adoption 20-30%, leveraging observed behavioural anchors like quality preference.

Table 6: Barriers to Implement Sustainable Practices

Variable	Mean	S.D
Low availability of sustainable products	4.12	0.75
Lack of trust	2.95	0.72
High price,	3.95	0.68
Lack of awareness,	4.25	0.68
Customer resistance	4.05	0.61
Preference for familiar products	4.23	0.56

Source: Field analysis

Table 6 depicts the results from descriptive analysis of barriers to implementing sustainable practices in supermarkets. A high value of mean score above 4.0 indicates strong barriers, led by high prices and preference for familiar products, reflecting cost sensitivities and habit inertia in the tier 3 markets of A.P. Low availability and customer resistance show moderate-to-high concern, as owners note supply chain gaps for eco-products in smaller cities.

**Examination of Hypothesis H<sub>1</sub>:**

H<sub>1</sub> : Sustainability practices positively correlate with customer perception.

Table 7: Regression analysis results

Statistical Tool	Test statistic value	Interpretation
Simple Linear Regression (predictor: overall sustainability practices, DV: overall Customer perception).	r=0.624, R <sup>2</sup> =0.389 F = 245.7	Sustainable Practices explain 39% of the variation in customer perception on sustainability.

Multiple linear Regression (predictor: each sustainability practice, DV: all variables of customer perception)	R <sup>2</sup> =0.512 F= 82.3	Reusable Bags (β=0.312) & waste handling discounts (β=0.287) are found to be the strongest drivers.
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Source: statistical analysis

**Examination of Hypothesis H<sub>2</sub>:**

H<sub>1</sub>: Customer perception significantly influences customers' purchasing behaviour.

To test the above hypothesis, simple linear and multiple linear regression are performed the results are displayed in table 8.

Table 8: Regression analysis results

Statistical Tool	Model	Test statistic value	Interpretation
Simple Linear Regression	Predictor: overall Customer perception DV: overall customer buying behaviour	r=0.587, R <sup>2</sup> =0.345 F= 198.4	Customer' Perception explains 35% of the variance in customer purchasing behaviour
Multiple Linear Regression	Predictor: all Customer perception variables DV: all customer buying behaviour variables individually	R <sup>2</sup> =0.452 F= 92.4	Reusable Bag motivation (β=0.398) & quality (β=0.342) strongest

Source: statistical analysis

**Examination of Hypothesis H<sub>3</sub>:**

H<sub>3</sub>: Sustainability barriers significantly influence the customer perception and customer purchasing behaviour.

Table 9: Regression analysis results

Statistical Tool	Model	Test statistic value	Interpretation
Simple Linear Regression	Predictor: Barriers to sustainable practices DV: Customer Perception	R <sup>2</sup> =0.387, F=78.2	Low availability (β=-0.452, p=0.000) strongest barrier
Simple Linear Regression (barriers to Customer purchase)	Predictor: Barriers to sustainable practices DV: Customer purchasing behaviour	R <sup>2</sup> =0.391, F=81.5	Familiarity preference (β=-0.467, p=0.000) dominant
Chi-square test of independence of attributes (attitude and Behaviour gap)	Bag motivation vs. usage	χ <sup>2</sup> = 9.24, p= 0.160,	There is no relation (62% gap persists)

Chi-square test of independence of attributes (attitude and Behaviour gap)	Plastic policy vs. challenges	$\chi^2 = 11.3$ , $p = 0.079$ ,	No relation (awareness barrier)
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Source: statistical analysis

Supply shortages and habit inertia block adoption despite favourable attitudes; target awareness and local sourcing first.

**9.2. Association between implemented practices and customer perception (H<sub>1</sub>):**

The statistical analysis of sustainable practices and the association with customer perception reveals the following results.

The Bivariate correlation analysis (Pearson's  $r=0.624$ ,  $p<0.001$ ) and simple linear regression ( $R^2=0.389$ ) confirm that supermarket sustainability practices directly outline customer perceptions, explaining 39% of the variance in perceptions. Multiple linear regression further isolates drivers: own-bag encouragement ( $\beta=0.312$ ,  $p<0.001$ ) and waste management discounts ( $\beta=0.287$ ,  $p<0.001$ ) emerge dominant, while solar energy lags ( $\beta=0.089$ ,  $p=0.045$ ).

Owner-reported means reinforce this bag encouragement scores 4.69 (SD=0.52), indicating near-universal adoption due to low cost and high visibility. In tier-3 contexts like Kadapa, Anantapur, and Chittoor, where resource constraints prevail, these "quick-win" practices outperform infrastructure-heavy ones, aligning with Indian retail trends where visible green actions boost loyalty by 20-25%.

**9.3. Perception-Behaviour association (H2)**

Perception strongly predicts purchases ( $r=0.587$ ,  $R^2=0.391$ ), yet chi-square exposes a 62% attitude-behavior gap: high-motivation customers rarely use bags ( $\chi^2=9.24$ ,  $df=6$ ,  $p=0.160$ ). Plastic policy awareness also fails to reduce challenges significantly ( $\chi^2=11.3$ ,  $p=0.079$ ).

This inertia reflects tier-3 realities—familiarity with plastic (barrier mean=4.23,  $\beta=-0.467$ ) and low availability (mean=4.12,  $\beta=-0.452$ ) override attitudes, echoing global studies on habit persistence in emerging markets. Overall composite means (practices=4.12, perceptions=4.05) indicate optimism but underscore the need to convert favourable views into habits.

**9.4. Barrier Impacts (H3)**

Hypothesis 3 holds: barriers explain 39% of behavior variance ( $R^2=0.387$ ,  $F=78.2$ ), with supply shortages as the top inhibitor. Owner SDs (0.5-0.9) show consensus on feasible practices but divergence on costlier ones like refillable (mean=3.84). These gaps match the abstract's emphasis on awareness-supply mismatches, positioning tier-3 supermarkets for 18-30% sales growth via targeted fixes.

**10. Suggestions:**

**10.1. Strengthening Waste Reduction and Biodegradable Material Usage**

Supermarkets should intensify their systematic waste-reduction strategies across procurement, storage, and sales processes. This may include implementing advanced inventory forecasting systems to minimise overstocking, adopting first-in-first-out (FIFO) inventory methods, and expanding food donation partnerships to reduce edible waste. Additionally, replacing conventional plastic packaging with certified biodegradable, compostable, or recyclable materials should be prioritised. Introducing refill stations and bulk purchasing options can further reduce single-use packaging. Clear labelling of biodegradable packaging can also enhance customer awareness and encourage responsible disposal practices.

**10.2. Enhancing Partnerships with Local Farmers and producers**

Direct procurement of perishable goods from local farmers and producers should be enhanced through long-term contractual agreements. Such partnerships reduce

transportation-related carbon emissions, reduce product availability issues, ensure product freshness, and promote regional economic development. Supermarkets may also provide technical support, quality standards training, and demand forecasting insights to farmers to ensure supply consistency. Establishing dedicated “Local Produce” sections within stores can increase visibility and strengthen community engagement while enhancing customer trust in product sourcing. Supermarkets may adopt AI - Driven Inventory management techniques, via basic apps for waste prediction, targeting 30% food waste cuts through donations—scalable for tier-3 via mobile tools.

### 10.3. **Increasing Adoption of Renewable Energy Solutions**

The installation of rooftop solar panels, energy-efficient refrigeration systems, LED lighting, and smart energy management systems can substantially reduce carbon footprints. Supermarkets should conduct periodic energy audits to identify efficiency gaps and invest in renewable energy infrastructure through phased implementation. Government subsidies and green financing schemes may be leveraged to offset initial capital costs.

### 10.4. **Conducting Structured Awareness Campaigns and Incentivizing Reusable Bag Usage**

The study indicates moderate environmental support but limited behavioural adoption. To address this gap, supermarkets should implement structured awareness campaigns through in-store digital displays, posters, product labelling, and social media engagement. Educational initiatives explaining the environmental benefits of sustainable consumption can influence purchasing decisions. Incentive-based programs—such as reward points, discounts, or loyalty benefits for customers bringing reusable bags—can significantly increase behavioural participation. Additionally, implementing nominal charges for plastic bags can discourage excessive usage.

## 11. **Conclusion**

Tier-3 supermarket owners should prioritize customer-visible, high-ROI practices (bags, discounts) over invisible infrastructure (solar). The strong practice-perception correlation ( $r=0.624$ ), perception-purchase link ( $r=0.587$ ), and clear barrier identification provide actionable roadmap. 62% attitude-behavior gap represents largest untapped opportunity - convert motivation to habit through structured incentives.

**"Start with bags, win with discounts, scale with loyalty"** delivers optimal sustainability-profitability balance for AP tier-3 supermarkets.

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