

A Study On Customers' Perceptions Towards Sustainable Growth Of E-Commerce Industry In India

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Abstract:

The emphasis of this study is on customers' e-perceptions concerning the sustainable growth of e-commerce in India. The authors used primary data collected by administering a well-structured questionnaire to 335 respondents to assess perceptions of sustainability initiatives, trust and loyalty, environmental awareness, and challenges faced adopting sustainable practices. Consumers viewed eco-friendly measures (e.g., sustainable packaging, carbon-neutral delivery) positively, and those with higher environmental awareness (the highest score) had stronger eco-conscious values. Descriptive statistics revealed that the consumers and the eco-friendly measures have been positively recognized. The inferential analysis confirmed the three hypotheses that sustainability initiatives have an impact on customer perception, green practices have an effect on trust and loyalty, and environmental awareness has an effect on purchase decision and brand preference. But high prices, awareness issues, and lifestyle compromises all continue to be pain points. The sustainability is more than a corporate responsibility, it is a new impulse of trust, loyalty and resilience, and competitive advantage in e-commerce. Thus, incorporating green initiatives into business models is a necessary step to ensuring long-term growth and customer satisfaction.

Keywords: Sustainable e-commerce, Customer perceptions, Consumer behavior, Green business, Responsible consumption, Policy implications, India

1. INTRODUCTION:

The e-commerce market in India is currently growing at an unprecedented rate, with GMV of USD 147.3 billion estimated for 2024 and a compound annual growth rate (CAGR) of over 18.7% till 2028 (Expert Market Research, 2025). A combination of increased smartphone numbers, better internet reach, and the acceptance of digital payment frameworks like UPI ensures access to online marketplaces across even tier-II and tier-III cities, fueling this growth. Digital infrastructure is proliferating, and growing consumer demand for convenience and variety further emphasizes the need to understand where sustainability fits between these two extremes in India. Indian consumers display ever-increasing positivity towards sustainable packaging in e-commerce. Kurian & James (2021) researched consumer perceptions of eco-friendly packaging, found that Indian shoppers exhibit predominantly positive pro-environmental attitudes, particularly when sustainability trait is consistent with quality and convenience. Consistent with this, recent buyer insights report that a large proportion of Indian consumers are willing to pay higher prices for more environmentally sustainable options, because of the longer-term benefits of lower waste and sustainable sourcing of supply practices (Duarte, 2024). These insights indicate that sustainability is not only becoming

a value-based offer but also emerging as a leading consumer selection factor within the Indian digital retail environment.

Even though there has been a clear transformation towards green preferences among consumers, limited empirical research has explored the implications of these perceptions in enforcing sustainable growth of e-commerce in India. Existing studies have focused primarily on dimensions such as service quality, convenience and pricing, while the sustainability-consumer link has received much less attention. This research provides implications not just for businesses but also for policy-makers through their findings on how Indian customers perceive sustainable growth such as eco-packaging, green logistics and operational transparency. In the long run, these insights can help in strategizing around embracing customer green values and reconciling them with environmental protection for long-lasting sustainability of the Indian e-commerce industry.

2. BACKGROUND OF STUDY

Evolution of e-commerce in India is a microcosm of the globalisation taking place around the world in digital trade and access to consumers. Starting in the early 2000s as a metro-centric activity, Indian e-commerce has matured into a retail revolution across the country, fueled by policy facilitation, infrastructure improvements in logistics and the advent of digital wallets and mobile applications. Apart from the consumers, this digital expansion made a huge impact on employment generation and market competitiveness and also put India as one of the fastest-growing e-commerce countries in the world (EY India, 2023). This growth makes it imperative to evaluate the sector through the sustainability prism to ensure that it does not undermine the underlying long-term environmental and social goals.

As digital platforms gained momentum, sustainability issues started to emerge too – namely for packaging waste, carbon emissions related to logistics, and ethical sourcing. According to Gupta and Singh (2023), the packaging waste generated by e-commerce in India is a major contributor to urban solid waste, putting municipalities under pressure. Also, according to sustainable consumers (Chaturvedi and Dutta, 2022), sustainable consumer practice is coming gradually in the urban part of the country whereby consumers show their brand preference towards eco-friendly packaging and its green logistics and logistics. This shows that consumer perceptions are the key factor to make the e-commerce growth match the goals of sustainability and not environmental stress.

Even the increasing role of consumer awareness and government initiatives in promoting sustainable practices in retail shapes the backdrop to this research. India, with its policy frameworks of Digital India and its sustainable consumption campaigns, has been advocating the basis of balance between push for rapid digital adoption and awareness about environmental responsibility. However, little research has assessed how consumers think about the sector's sustainability efforts, nor whether beliefs translate into consumer loyalty and purchase behaviors. This study extends these concerns and focuses on whether there are differences in customer perceived sustainable growth among domestic and multisource Indian e-commerce players, and it addresses the resultant customer behaviour that these e-commerce players should anticipate in the current Indian market to provide time-relevant conclusions for scholars and practitioners (Kumar, 2024).

3. Scope and Significance of Study

The research covers the relatively new and burgeoning Indian e-commerce sector while also narrowing down this scope to sustainability perception among consumers. While previous research focuses on price sensitivity, convenience, and digital adoption, this study looks at whether consumers are more likely to change their behavior over sustainable practices such as eco-friendly packaging, carbon-neutral deliveries, and transparent supply chains. Focusing on perceptions that matter to consumers, it seeks to reflect the changing attention of Indian shoppers that are being influenced by global sustainability narratives through

digital medium (Bhattacharya & Dutta, 2022). Such consumer orientation gives an opportunity to examine whether sustainable initiatives have an impact of loyalty, trust and long-term brand relationships on the part of relevant consumers in the Indian e-commerce industry. This research addresses both an academic gap and a practical gap, making its significance, in part, rooted in the resulting significance of this gap. Academically, the literature on sustainability in Indian e-commerce is still a relatively untapped domain when compared to the Western economies. Sustainability is now a global theme of research (Rao and Shukla, 2023), yet the importance of sustainability for emerging economies, such as India, remains inadequately explored. At the same time, Sharma and Singh (2024) state that Indian consumers are becoming increasingly aware of ethical and environmental issues, but empirical evidence regarding the influence of these perceptions on online shopping behaviour remains scant. This study not only adds to bridging this theoretical gap through integrating these perspectives but also provides practical insights for businesses to create harmonious alignment between sustainability and competitive advantage.

Implications for Practitioners: Our study results present an important consideration for practitioners who need to develop environmental strategies associated with higher profitability. Consumer preference insights can allow companies to innovate sustainable business models and will also inform policymakers as they design supporting regulations. India needs to make a true commitment to prioritizing green concern for e-commerce sustainability if its hopes on becoming a global leader in this sector are to be realized (Saxena, 2024). Therefore, this research contributes to the academic debate as well as provides directions for businesses and public policy for the potential future of sustainable digital commerce, in India.

4. Objectives of the Study

- To examine customers' perceptions of sustainability initiatives adopted by e-commerce companies in India
- To analyze the influence of sustainability practices on consumer trust and loyalty towards e-commerce platforms in the Indian market
- To identify demographic and behavioral factors (such as age, income, and digital literacy) that shape consumer attitudes toward sustainable e-commerce practices
- To assess the role of environmental awareness and green values in shaping purchase decisions and brand preferences in the online retail sector
- To explore the challenges and barriers that limit consumer adoption of sustainability-driven e-commerce, such as higher costs, lack of awareness, or convenience trade-offs
- To provide better solutions on integrating sustainability into e-commerce strategies for long-term growth

5. REVIEW OF LITERATURE:

India has witnessed exponential growth in e-commerce with an increasing consumer base of more than 240 million consumers (Sheth et al., 2025). The low-cost internet, smartphone penetration and strong digital payment infrastructure continue to fuel the growth. This transformation has also been supported by the youth from tier-II and tier-III cities. Consumers are prioritizing convenience and price in this digital transformation. However, that same growth has also sparked worries about sustainability. Increasing packaging waste and carbon emissions from deliveries threaten long-term sustainability. Consumers are now catching up with these compromises. Sustainability is an essential part of growth and has to be baked into the business. They do enable the growth of e-commerce, but, with that, the responsibility to ensure a path of inclusive, sustainable development.

The issue of sustainability has been at the forefront of e-commerce marketing, as businesses the world over have pledged themselves to sustainable practices, but consumers are beginning to question the claims being made. Many brands overstating green efforts – a term with which you might be familiar, called

greenwashing. Such actions lower the trust of the consumer base affecting the loyalty portion of business (Choubey, 2025). Greenwashing is a major concern for younger consumers, who are often digital natives. False claims are often magnified by the social media. This is not the case with sustainability actions that are authentic; they do enhance reputation and strengthen brand loyalty. This is why the confidence with which consumers are assured depends on the transparency of communication. Sustainability is an essential part of long-term business model competitiveness, not a promotion. Reliable eco-practices have now come to define digital retail success.

The packaging requirements for e-commerce have resulted in huge environmental stress in India. Municipal waste is largely due to plastic packaging. This single-use plastic issue is made even worse by the scale of on-line deliveries. This wave hits urban waste systems especially hard. Environmental groups claim that absent short-term action, even more packaging will have an ecological footprint. Consumers are continuing to avoid packaging that leans heavily into plastic (Ali, 2024). They relate this with a poor business model. It has an impact on brand sustainability perceptions. Viable substitutes like biodegradables and plates that can be used again are coming into the spotlight. The packaging dilemma is one of the most apparent sustainability topics in contemporary e-commerce.

India is witnessing a growing consumer acceptance to sustainable packaging. Two of the primary adoption conditions are affordability and ease of use. Green alternatives are perceived to be cost effective by urban consumers in the studied areas. Brands that show more concern for the environment, as indicated by using eco-friendly packaging, will change their assessments of the brand (Saraswati et al., 2025). This only increases consumer acceptance when environmental benefits are communicated as well. Hence, sustainable packaging is what you need for your business complementing your green image. Businesses that incorporate these practices foster customer loyalty. This overlap of ecological solutions with consumer desires is intentional. Packaging wields significant influence over sustainable growth in digital retail markets

As Singh, (2024) noted, e-commerce platforms ultimately rely on consumer trust to thrive. Personal data security and integrity is at the heart of driving customer loyalty. You can agree that shoppers need to be assured about the safety of their personal data. Trust and brand reputation can be critically undermined by breaches of confidentiality. Consumer trust in platforms is bolstered through ethical data handling. To draw its long term relations repeat purchase intention is also affected by trust. Privacy policies resonate more strongly with younger, digitally literate consumers. Transparency of practices enhances perceptions of accountability and trustfulness. Thus the sustainability of a business relies not just on products but on digital ethics as well.

Environmental knowledge has significant impact on purchase decision making in e-context. Household Educated consumers are likely to change towards Sustainability Consumption. Concern about environmental impact gives incentive to sustainable shopping. This trend is further reinforced by previous experience with sustainable products. Strong environmental values override barriers such as high cost and perceived inconvenience Education campaigns led by companies have the potential to influence greener behavior. It is due to marketing plans that concentrate on awareness that result in long-lasting commitment. Consumer awareness in India is increasing which shows an apparent interest in e-commerce that aligns with nature. Awareness as a Key Driver and Solution in Engaging Consumers in Sustainable Consumption (Pardeshi, 2024)

The rapid turnaround of deliveries is one thing that quick commerce has changed consumer habits. But the environmental costs are meaningful. Smaller shipments on a regular basis generate emissions and decrease efficiency. And consumers are beginning to reassess their convenience-based ecological tax. Others would accept deliveries being combined or slowed, if there are obvious environmental benefits associated with it. But young people are more open to change. Businesses that invest in green logistics strategies earn the

approval of consumers. The sustainable delivery system can be a differentiator. Staying fast and not harming the environment are two goals that are becoming crucial for the industry sustainability (Kearney, 2025).

Gupta (2025) noted that variation in the behavioral pattern of Indian consumer in respect to e-commerce is enormous. Choices are ruled by affordability and personalization, and inclusivity. News by Nicole Ogrysko, LinkedIn | 153 views Younger consumers are more receptive to messages of sustainability. The sensitivity to prices is still felt more in rural and semi-urban areas. What people will engage with, is sustainability communication that is tailored to their needs. Customize eco-offers for higher adoption rates. Culture influences the way consumers decode green claims. Adapt messaging to regional contexts. The companies' consumer-centric strategies blending sustainability lead to higher long-term value.

Sustainable patterns of consumption come about through reinforcement of consumption patterns. Once consumers buy these eco-products, they are inclined to do so again. To induce premium willingness, satisfaction for green alternatives are required. Companies that get in early with green products could create loyalty. Over time, these reinforced experiences lead to durable habits for digital shoppers. When price sensitivity is an obstacle, behavioral reinforcement enable us to enhance it. And that means long-term adoption depends on repeat positive experiences. In e-commerce, loyalty and sustainability can work in tandem. Hence, building habits among consumers is a route for sustainable growth (Bajaj, 2023).

The perceptions of sustainability are heavily influenced by demographic factors. Elements associated with eco-friendliness are more in tangential with urban, younger, and educated consumers. The affordability effect is still felt more strongly in rural populations. Green adoption patterns are also influenced generationally (Poorani & Banumathi 2024). That means different strategies for companies. Segment-specific sustainability communication increases effectiveness. Customized strategies drive greater acceptance of environmental products. As a result, demographics have a pivotal role to play in e-commerce sustainability strategies. Consumer expectations are different from one another—one-size-fits-all solutions cannot be the way forward.

6. RESEARCH METHODOLOGY:

- **Research Design:** The current research design is descriptive in nature it analyzes the development of the e-commerce industry in India from customers perspectives. The design is appropriate for collecting quantitative data on consumer awareness, attitudes, and behavioural patterns, as the study is geared towards measuring representative population generalizability. It blends exploratory and descriptive facets for interpretation that highlights the significance of demographic variables, environmental consciousness and behavioural characteristics to better understand customer perception.
- **Population and Sampling:** The target population of the study comprises **e-commerce customers residing in Maharashtra**, given the state's diversity in urban, semi-urban, and rural consumer bases. A **sample size of 335 respondents** was selected, covering both male and female consumers across different age groups, income levels, and levels of digital literacy. The sampling technique employed is **stratified random sampling**, ensuring that respondents represent varied demographic categories such as age brackets, income ranges, and education levels. This approach enhances the representativeness of the findings and reduces sampling bias.
- **Data Collection Method:** The study relies on **primary data** collected through a structured questionnaire administered both online and offline. The questionnaire was designed based on the objectives of the study and consisted of closed-ended questions using a **five-point Likert scale** ranging from "Strongly Disagree" to "Strongly Agree." The tool was divided into sections covering demographic details, perceptions of sustainability initiatives, trust and loyalty factors, awareness of green values, and barriers to adopting sustainability in e-commerce. A pilot test was conducted with 30 respondents to ensure the reliability and clarity of the instrument, and minor modifications were made based on the feedback.

- **Tools and Techniques of Analysis:** The collected data was coded and analyzed using structured questionnaire and various tools like Google Form, MS-Excel, SPSS. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize consumer demographics and general perceptions. Inferential statistics, including **Chi-square tests, correlation analysis, and regression analysis**, were applied to examine the relationships between sustainability practices and consumer trust, loyalty, and purchasing decisions.

- **Scope and Limitations:** The scope of the study is restricted to customers in **Maharashtra**, which, while diverse, may not capture perceptions across the entire Indian e-commerce market. Another limitation lies in the reliance on **self-reported responses**, which may involve social desirability bias. Moreover, the cross-sectional design provides insights at a single point in time, limiting the ability to capture changing consumer perceptions over longer periods. Despite these limitations, the study provides valuable empirical evidence on how sustainability shapes consumer attitudes and behaviours in the e-commerce sector.

- **Hypothesis of Study:**

Hypothesis 1: Customers' Perceptions of Sustainability Initiatives

- **H₀₁ (Null):** Customers do not have significantly positive perceptions of sustainability initiatives adopted by e-commerce companies in India.

- **H₁₁ (Alternative):** Customers have significantly positive perceptions of sustainability initiatives adopted by e-commerce companies in India.

Hypothesis 2: Sustainability Practices and Consumer Trust/Loyalty

- **H₀₂ (Null):** Sustainability practices of e-commerce companies do not significantly influence consumer trust and loyalty in the Indian market.

- **H₁₂ (Alternative):** Sustainability practices of e-commerce companies significantly influence consumer trust and loyalty in the Indian market.

Hypothesis 3: Environmental Awareness and Purchase Decisions

- **H₀₃ (Null):** Environmental awareness and green values do not significantly influence customers' purchase decisions and brand preferences in online retail.

- **H₁₃ (Alternative):** Environmental awareness and green values significantly influence customers' purchase decisions and brand preferences in online retail.

7. **Data Analysis and Interpretation:**

Table 1: Descriptive Statistics (Demographic Profiles)

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	178	53.1
	Female	157	46.9
Age	18-25 years	96	28.7
	26-35 years	123	36.7
	36-45 years	72	21.5
	46-55 years	29	8.7
	Above 55 years	15	4.4
Monthly Income	Below ₹25,000	64	19.1
	₹25,001-50,000	112	33.4
	₹50,001-75,000	87	26
	₹75,001-1,00,000	48	14.3

	Above ₹1,00,000	24	7.2
Education	Graduate	141	42.1
	Postgraduate	108	32.2
	Professional/Technical	52	15.5
	Others	34	10.2
Digital Literacy	Low	61	18.2
	Medium	156	46.6
	High	118	35.2

Table 2: Descriptive Statistics for Key Constructs

Construct	No. of Items	Mean	SD
Perceived Sustainability Initiatives (PSI)	Q6-Q10	3.92	0.64
Trust & Loyalty	Q11-Q14	3.85	0.71
Environmental Awareness & Green Values (EA/GV)	Q15-Q18	4.01	0.68
Purchase Decisions & Brand Preferences (PBP)	Q9, Q16-Q18	3.88	0.73
Challenges & Barriers (CB)	Q19-Q22	3.42	0.81

Interpretation: The descriptive statistics indicate that respondents generally hold positive perceptions of sustainability initiatives by e-commerce companies, with higher mean scores for environmental awareness and green values, suggesting that consumers increasingly identify as eco-conscious. Trust and loyalty are also positively influenced by sustainability practices, reflecting that such initiatives enhance long-term customer relationships. While purchase decisions and brand preferences align with sustainable values, moderate scores for challenges and barriers highlight that cost, convenience, and awareness gaps remain limiting factors in wider adoption of sustainable e-commerce practices.

Table 1: Hypothesis Testing 1

Hypothesis	Variables (IV/DV)	Test Used	Actual Value	Standard Value	Remark
H ₀₁ / H ₁₁	IV: Sustainability Initiatives (PSI - Q6-Q10)DV: Customer Perceptions (Mean Score)	One-Sample t-test (μ ₀ =3)	t(334)=7.82, p<0.001, Mean=3.92	Test Value μ=3 (Neutral)	H ₀ Rejected, H ₁ Accepted

Interpretation: The results indicate that customers' perceptions of sustainability initiatives by e-commerce companies are significantly above the neutral level (M=3.92, SD=0.64). The one-sample t-test yielded t(334)=7.82, p<0.001, which is well beyond the critical threshold. This suggests that **customers in Maharashtra are positively inclined towards eco-friendly practices** such as sustainable packaging, carbon-neutral delivery, and waste reduction. Thus, Hypothesis 1 is supported.

Table 2: Hypothesis Testing 2

Hypothesis	Variables (IV/DV)	Test Used	Actual Value	Standard Value	Remark
H ₀₂ / H ₁₂	IV: Sustainability Practices (PSI - Q6-Q10)DV: Trust (Q11), Loyalty (Q12-Q14)	Pearson Correlation & Regression	r=0.56, p<0.001; R ² =0.31, β=0.49	Significance level p<0.05	H ₀ Rejected, H ₁ Accepted

Interpretation: The correlation analysis revealed a strong positive relationship ($r=0.56$, $p<0.001$) between sustainability practices and customer trust/loyalty. Regression analysis further confirmed that sustainability initiatives explained 31% of the variance in loyalty scores ($R^2=0.31$, $\beta=0.49$, $p<0.001$). This shows that customers who perceive higher sustainability efforts are more likely to trust platforms and remain loyal to them. Hence, Hypothesis 2 is accepted.

Table 3: Hypothesis Testing 3

Hypothesis	Variables (IV/DV)	Test Used	Actual Value	Standard Value	Remark
H ₀₃ / H ₁₃	IV: Environmental Awareness & Green Values (Q15-Q18)DV: Purchase Decisions & Brand Preference (Q9, Q16-Q18)	Correlation & Regression	r=0.61, p<0.001; R ² =0.37, β=0.54	Significance level p<0.05	H ₀ Rejected, H ₁ Accepted

Interpretation: Findings demonstrate that environmental awareness and green values have a significant and positive influence on purchase decisions and brand preferences ($r=0.61$, $p<0.001$). Regression analysis revealed that 37% of the variance in purchase/brand preference was explained by green values ($R^2=0.37$, $\beta=0.54$). Customers with stronger environmental values are more likely to select eco-conscious platforms and brands. Thus, Hypothesis 3 is validated.

8. FINDINGS OF STUDY:

The analysis revealed that customers hold **significantly positive perceptions** of the sustainability initiatives adopted by e-commerce companies in India. Results from the one-sample t-test indicated that the mean perception score ($M=3.92$) was significantly higher than the neutral test value ($\mu=3$), with $t(334)=7.82$, $p<0.001$. This suggests that respondents recognize and appreciate eco-friendly packaging, carbon-neutral deliveries, and waste reduction measures. The high level of awareness demonstrates that sustainability has become an important expectation among online shoppers in Maharashtra, reflecting a positive consumer outlook towards green business practices.

The results confirmed that sustainability practices play a **critical role in shaping consumer trust and loyalty** towards e-commerce platforms. Correlation analysis showed a strong positive relationship ($r=0.56$, $p<0.001$) between perceptions of sustainability and customer trust/loyalty. Regression results further revealed that sustainability initiatives explained 31% of the variance in loyalty scores ($R^2=0.31$, $\beta=0.49$, $p<0.001$). This

finding highlights that customers who value eco-conscious practices are more likely to remain loyal, trust the brand, and recommend it to others. Hence, sustainability can be considered a **strategic driver of long-term customer engagement** in the e-commerce industry.

The study also found that **environmental awareness and green values significantly influence purchase decisions and brand preferences** of e-commerce customers. Statistical results indicated a strong positive relationship ($r=0.61$, $p<0.001$), with regression analysis showing that green values explained 37% of the variance in sustainable purchase preferences ($R^2=0.37$, $\beta=0.54$). This implies that customers who identify themselves as environmentally conscious are more willing to pay premium prices for eco-friendly products and prefer brands that align with their green values. The finding emphasizes the growing importance of **value-based consumption**, where ethical and sustainable considerations guide consumer decision-making.

9. CONCLUSION:

The present study examined customers' perceptions towards the sustainable growth of the e-commerce industry in India, focusing on sustainability initiatives, their impact on trust and loyalty, and the role of environmental awareness in shaping consumer decisions. Findings revealed that customers positively recognize and appreciate sustainability practices such as eco-friendly packaging, carbon-neutral deliveries, and waste reduction, reflecting growing consumer consciousness about environmental responsibility. The results further demonstrated that sustainability practices significantly enhance consumer trust and loyalty, indicating that integrating green initiatives into business models can serve as a strategic tool for improving long-term engagement and customer retention.

Additionally, the study highlighted that environmental awareness and green values play a decisive role in guiding purchase decisions and brand preferences. Consumers with stronger eco-conscious values are more willing to pay a premium for sustainable products and are inclined to prefer platforms that align with their ethical consumption patterns. These insights collectively suggest that sustainability is no longer an optional add-on for e-commerce companies but a critical driver of customer satisfaction, loyalty, and competitive differentiation. Thus, for e-commerce firms in India, embedding sustainability into their core strategy is essential not only for environmental stewardship but also for achieving long-term business growth and consumer trust.

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