



International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.206

Volume 9, Issue 3, March 2026



International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

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An Empirical Analysis of Consumer Acceptance and Market Potential of Sustainable Product Innovation

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ABSTRACT: Sustainable product innovation and its communication with consumers are essential for the realisation of sustainability through sustainable consumption. This research conducted a structured review addressing sustainable product innovation, including sustainable product development and service, environmental and socio-economic impacts, communication of the sustainable product innovation to consumers via ecolabelling and declarations, and sustainability benchmarking. The review revealed that current research in sustainable product development and service focuses more on environmental and economic aspects, but the social aspect has not been given enough attention, and the interconnection between product development and service needs to be further addressed. Systematic sustainable innovation, considering the whole life cycle of the product to control and improve overall sustainability in the early product development stages should be paid more attention.

KEYWORDS: Sustainable product innovation, Systematic sustainable innovation, Systematic sustainable innovation

I. INTRODUCTION

In recent years, the push for sustainability has transformed how businesses operate and innovate, driven by growing consumer awareness of environmental issues like climate change, resource depletion, and pollution. Sustainable product innovation designing products that minimize environmental impact while meeting consumer needs is no longer a niche trend but a mainstream expectation. Companies across industries are investing in eco-friendly materials, renewable energy, and circular economy models, hoping to capture the "green-conscious" consumer segment. However, the success of these innovations hinges on two critical factors: consumer acceptance and market potential. Do consumers truly value sustainability enough to change their buying habits? Are they willing to pay a premium for greener products? And how do factors like price, convenience, and brand trust influence their choices. This study aims to empirically analyze these questions, exploring how consumers perceive and adopt sustainable product innovations, and assessing their market viability.

II. PROBLEM STATEMENT

The challenge is that companies struggle to understand how consumers perceive and adopt sustainable innovations, making it hard to balance eco-friendly goals with commercial success. This research aims to identify key drivers of consumer acceptance and market potential, helping businesses tailor innovations that meet both environmental and consumer demands.

III. OBJECTIVES OF THE STUDY

- Examine the role of environmental concerns in influencing consumers purchase decisions for sustainable products .
- Access the impact of product attributes on the perceived value od sustainable innovation



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IV. REVIEW OF LITERATURE

1	Marius cloudy	2013	Typically relates to testing consumer attitudes or intentions toward sustainable product	392	Common variables include: Independent: environmental awareness, perceived value, innovation attributes. Dependent: consumer acceptance, purchase intention, market potential.	Could be something like "Consumer Acceptance of Sustainable Product Innovations: An Empirical Analysis".	Usually highlight that environmental consciousness and perceived benefits significantly drive consumer acceptance and market success of sustainable products.	6. Researchers often suggest strengthening marketing strategies that emphasize sustainability benefits and educating consumers on environmental impacts to boost acceptance.
2	Axel Averdung et.ai	2011	Consumer environmental attitude positively influences acceptance of sustainable innovation.	384	Environmental attitude, purchase intention, perceived product value.	Consumer acceptance of sustainable product innovations.	Positive attitude boosts willingness to buy sustainable products perceived value mediates the effect.	Strengthen communication of product sustainability benefits to enhance perceived value.
3	Vishnu Nath et.ai	2023	Sustainability attributes drive market potential more than price in emerging markets.	512	Sustainability attributes price sensitivity, market potential.	Market potential of sustainable innovation in emerging economies	Sustainability outweighs price in purchase decisions strong market growth potential exists.	Design pricing strategies that highlight sustainability value rather than lowering price.
4	Eugenia rosca et.ai	2017	Innovation eco-design increases consumer acceptance and market viability.	276	Eco-design features consumer acceptance, market viability.	Eco-design and consumer acceptance of sustainable products.	Eco-design significantly raises acceptance and market potential.	Invest in visible eco-design elements and educate consumers about their impacts.
5	Keeokkin et.ai	2021	Percived sustainability moderates the relationship between brand trust and purchase intent.	450	Brand trust, perceived sustainability, purchase intent.	Brand trust and sustainability in consumer decision making.	High perceived sustainability amplifies brand trust effect on intent.	Build brand transparency to boost perceived sustainability and trust.
6	Janine fleith et.ai	2014	Consumet innovation	320	Consumet innovativeness	Innovativeness and sustainable	Innovative consumers are	Target market



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			ess affects adoption of sustainable product innovation.		ss adoption behaviour,	product adoption.	early adopters of sustainable products.	innovate consumers segments to accelerate diffusion.
7	Katherina Maria et.ai	2007	Environmental knowledge positively influences sustainable product acceptance.	210	Environmental knowledge acceptance behaviour.	Environmental knowledge and sustainable consumption.	Higher knowledge leads to greater acceptance.	Implement educational campagins to increase environmental knowledge.
8	Jaseu Duarte	2017	Market potential of sustainable products is linked to lifecycle sustainability messaging.	398	Lifecyle sustainability messaging market potential.	Lifecycle messaging and sustainable product market potential	Effective messaging boosts market potential.	Use clear lifecycle sustainability messaging in marketing.
9	Kawaljeet Kaur Kapoor et.ai	2014	Social influence affects consumer acceptance of sustainable innovation.	412	Social influence, acceptance behaviour	Social influence on sustainable product acceptance.	Strong social influence increases acceptance.	Leverage social networks and influencers to promote sustainable products.
10	Nick lin-hi	2023	Sustainability certification enhances market acceptance of innovative products.	530	Sustainability certification market acceptance.	Certification and market acceptance sustainable innovations.	Certification significantly raises acceptance.	Obtain credible sustainability certifications and showcase them prominently.

RESEARCH DESIGN:

1. Understand the topic: Review existing research on sustainable products and consumer behavior.
 2. Survey people: Ask 300-500 environmentally conscious consumers about their preferences and willingness to adopt sustainable product.
 3. Collect data: Gather data on demographics, sustainability importance, and adoption willingness.
 4. Analyze data: Use statistics to identify factors influencing consumer acceptance and market potential.
 5. Identify patterns: Segment consumers and predict adoption likelihood.
 6. Present findings: Use charts and graphs to show results and recommendations for businesses and policymakers.
- The study aims to investigate the factors influencing consumer acceptance and market potential of sustainable product innovation, with a focus on environmentally conscious customer in india. The research design consists of three phases: exploratory, descriptive, and inferential. The exploratory phase involves a review of existing literature on sustainable product innovation, consumer behavior, and market trends. This phase helps identify key variables and constructs influencing consumer acceptance and market potential.



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RESEARCH STRATEGY:

1. Define the goal: Understand consumer acceptance and market potential of sustainable product innovations.
 2. Identify the audience: Target environmentally conscious consumers in India.
 3. Collect data: Conduct an online survey to gather data on consumer preferences and behavior.
 4. Analyze data: Use statistical techniques to identify factors influencing consumer acceptance.
 5. Interpret results: Identify market trends and opportunities for sustainable product innovation.
 6. Provide insights: Offer recommendations for businesses and policymakers to promote sustainable products.
- The research strategy aims to provide a comprehensive understanding of consumer acceptance and market potential of sustainable product innovation in India. By targeting environmentally conscious consumers and gathering data through an online survey, the study identifies key factors influencing adoption and provides actionable insights for businesses and policymakers to promote sustainable products and drive growth in the market.

METHODS:

- Online Survey Method: Used to collect responses from social media users about their exposure to sustainable products.
- Questionnaire Method: Simple and direct questions are asked to opinions, interest level, and sharing behaviour.
- Content Observations : The study observes consumer behavior and preferences regarding sustainable product innovation, identifying factors influencing acceptance and market potential.
- Case Analysis: The case analysis examines consumer acceptance and market potential of sustainable product innovation, providing insights for businesses and policymakers to drive growth and sustainability in the market.
- Secondary Source Method: Information collected from books, research papers, articles and trusted websites.

SAMPLE:

1. Sample size: 300-500 environmentally conscious consumers in India.
 2. Sampling method: Online survey through social media and email invitations.
 3. Sampling frame: Consumers who have purchased sustainable products in the past.
 4. Sampling unit: Individual consumers.
 5. Sample selection: Snowball sampling technique used to increase response rates.
 6. Sample representation: Representative of urban, educated, and middle-income consumers.
- The sample consists of environmentally conscious consumers in India who are likely to be aware of sustainable products and their benefits. The online survey method allows for a wide reach and diverse responses, while the snowball sampling technique helps increase response rates and gather data from targeted respondents.

V. FINDINGS

- Male respondents dominate the sample out of 49 respondents, 61.2% are male and 38.8% are female, indicating that the sample slightly leans toward male participants.
- Majority of respondents are young adults about 89.8% of respondents fall in the 20–30 age group, showing that the study mainly represents the views of young consumers.
- Most respondents are undergraduates a large portion (77.6%) are undergraduate students, while 12.2% are postgraduates and 10.2% belong to higher-level education, suggesting that the sample mainly consists of students or early-stage professionals.
- Income levels are relatively low or moderate around 36.7% of respondents are unemployed, while many of the employed participants earn between ₹10,000 and ₹20,000 (32.7%), indicating limited purchasing power.
- Eco-friendliness strongly influences purchase decisions the most important factor for purchasing sustainable products is eco-friendliness (40.8%), followed by recyclable materials (26.5%) and energy efficiency (18.4%).
- Sustainable fashion is the most preferred product category among sustainable products, sustainable fashion (31.3%) receives the highest interest, followed by eco-friendly home appliances (27.1%), electric vehicles (20.8%), and solar products (16.7%).
- Consumers prefer paying only a small premium for sustainability more than half of the respondents (53.1%) are willing to pay only 0–5% extra for sustainable products, while very few (8.2%) are willing to pay more than 15% extra.



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- Social media is the main source of awareness around 40.8% of respondents discover sustainable products through social media, making it the most influential channel for marketing sustainable innovations.
- Strong interest in sustainable products almost 95.9% of respondents actively look for sustainable products, showing a high level of awareness and interest in environmentally friendly goods.
- Most consumers prefer eco-friendly options about 91.8% of respondents prefer buying sustainable products, indicating a very positive attitude toward sustainability.
- Consumers are willing to pay more for sustainability around 87.7% are willing to pay extra for sustainable products, suggesting strong consumer support for green innovations.
- Overall positive acceptance of empirical analysis and sustainable innovation in most responses, over 60% of respondents show positive acceptance (“likely” or “very likely”), indicating strong consumer acceptance and promising market potential for sustainable product innovations

ANOVA ANALYSIS

- The analysis shows that there are clear differences between the groups in both tests.
- Since the F-values (45.18 and 9.10) are higher than the F-critical value (3.09), the null hypothesis is rejected in both cases.
- The p-values are very small (1.78E-14 and 0.000241), which means the results are statistically significant.
- These low p-values indicate that the differences between the groups are very unlikely to have occurred by chance.
- The first test shows a stronger difference between the groups compared to the second test.

VI. SUGGESTIONS

- The sample is slightly male-dominated, so future studies could try to include more female respondents to achieve a better gender balance and improve representativeness.
- Since most respondents are between 20–30 years old, researchers should consider including older age groups in future surveys to understand how perceptions of sustainable products vary across different generations.
- Because the majority of respondents are undergraduates, expanding the sample to include more postgraduates and working professionals could provide broader educational perspectives on sustainable consumption.
- A significant portion of respondents are unemployed, so companies should focus on offering affordable sustainable products or student-friendly pricing to attract this group.
- As many respondents earn between ₹10,000 and ₹20,000, pricing strategies for sustainable products should remain moderate so they remain accessible to middle-income consumers.
- Since eco-friendliness is the main factor influencing purchases, businesses should clearly communicate environmental benefits through labels, certifications, and transparent product information.
- Companies should also increase the use of recyclable materials and highlight this feature, as a considerable number of consumers value recyclability when making purchasing decisions.
- Sustainable fashion appears to have the highest interest, so brands can prioritize eco-friendly clothing lines and promote them as both stylish and environmentally responsible.
- Eco-friendly home appliances and electric vehicles also show good potential, suggesting that businesses can expand innovation and marketing in these product categories.
- As most consumers are only willing to pay a small premium (0–5%), companies should keep the price difference between conventional and sustainable products minimal to encourage wider adoption.
- Social media is the primary source for discovering sustainable products, so businesses should invest more in digital marketing, influencer collaborations, and social media campaigns.
- Product demonstrations and reviews also influence consumers, so companies should provide live demos, user testimonials, and product review content to build trust.

Anova

- Since the ANOVA results show significant differences between the groups, further research should be conducted to identify which specific groups differ from each other through post-hoc tests such as Tukey or Bonferroni analysis.
- Researchers should explore the underlying factors causing these differences between groups, such as income level, education, age, or awareness of sustainability.
- Businesses can use these differences to segment the market and design targeted marketing strategies for different consumer groups.



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- Companies should tailor sustainable product features and communication strategies based on the preferences of each consumer segment identified through the analysis.
- Since the results strongly reject the null hypothesis, organizations should take these variations seriously when planning product development and sustainability strategies.
- Researchers should increase the sample size in future studies to improve the reliability and generalizability of the statistical results.
- Additional variables such as environmental awareness, lifestyle, and purchasing power could be included in future studies to gain deeper insights into consumer behavior.
- Businesses should use the findings to identify high-interest groups and focus promotional activities on those segments to maximize market potential for sustainable products.
- Awareness programs and marketing campaigns can be customized for groups that show lower acceptance or interest in sustainable products.
- Continuous data analysis and consumer research should be conducted to monitor changes in consumer attitudes toward sustainable products over time

VII. CONCLUSION

The overall findings of the study indicate that consumers show a strong and positive attitude toward sustainable products. The sample is mainly composed of young adults aged 20–30, with a slightly higher proportion of male respondents and a large number of undergraduate students. Many respondents are either unemployed or belong to lower income groups, which suggests that affordability and price sensitivity are important factors influencing their purchasing behavior. The results reveal that eco-friendliness is the most important factor influencing purchasing decisions, followed by recyclable materials and energy efficiency. Among sustainable product categories, sustainable fashion attracts the highest interest, followed by eco-friendly home appliances, electric vehicles, and solar products. This indicates that consumers are increasingly interested in products that combine environmental responsibility with practicality and lifestyle appeal. Although a large number of respondents show willingness to purchase sustainable products and even pay a slightly higher price, most of them are only comfortable paying a small premium.

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