Empirical study on perceptions of consumers towards purchase of green consumer durables

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[Abstract] Consumer behavior and corporate strategy are heavily influenced, in various parts of the world, by sustainable practices. Industries are embracing green initiatives per the increasing consumer demand for green products, mainly within durable goods. Consumer awareness of sustainability is, however, rather variable, with purchasing decisions chiefly resulting from perceptions of assessed usefulness, ease of use, and associated risks. This study is an empirical exploration of consumer attitude towards green consumer durables in Karnataka, India, and aims to underline some of the driving forces or impediments for adoption. The modified Technology Acceptance Model (TAM) is adopted here to analyze how perceived usefulness, ease of use, and risk ultimately impact the attitudes toward green durables and actual purchasing behavior. Findings reveal that while consumers agree on the perceived usefulness of such green products, accessibility, cost and performance considerations prevent the critical mass. The implications are strategic in nature for multinational companies, policymakers, and sustainability-oriented enterprises looking to develop green product markets. The study will contribute to international management by emphasizing consumer perception in sustainable product adoption and providing guidance to corporations coping with green consumerism at the international level.

[Keywords] green durables, sustainability, TAM, management strategies and consumers perception.

Introduction

Our planet is facing a lot of threats such as air and water pollution, food waste, plastic pollution, deforestation and the like. There has been an increase in worrying ecological signs like land degradation, animal extinction and atmosphere pollution during the 1960s and 1970s. Then global warming and ozone holes in the 1990s, which resulted in consumers getting more and more aware of the environmental issues. In other words, more individuals became ecologically conscious consumers. In the twenty-first century, awareness of environmental issues has increased even further (Leonidou et al., 2010).

India is the fourth largest consumer durable product market in the world. However, when we consider the rapid changing divide between the urban and the rural markets and the heterogeneity among the several regions in the country, it seems to be an interesting challenge for green consumer durable product marketing (Dutta, 2016). Nowadays people are getting more and more aware of the environmental concerns around the world, the effects of their indiscriminate consumption and its influence and impact on the environment. Most consumers today want to live healthier life and are willing to spend more money for it. This could be a reason for customers with environmental awareness to have a strong intention to purchase and consume green products,

because of the green attributes and the green brand positioning (Braimah & Tweneboah-Koduah, 2011; Ogiemwonyi et al., 2023).

Companies like Honda, Toyota, and General Motors are also trying to become more environmentally conscious and work towards greener ways to preserve the environment (Suki, 2016). Several Enterprises have started to adopt green initiatives and manufacture green products to the market to satisfy customer demand (Barbaritano & Savelli, 2021; Haleem et al., 2023). Concern towards environment significantly affects the production attitude of the manufacturers and purchase of durable goods by the customers (Zhang & Dong, 2020; Elmor et al., 2024). In this regard a sustainable development strategy can also be achieved if the dynamics of the environment is implemented by the manufacturers, keeping in mind the concerns of buyers, towards production and sale of green durables for the preservation of the environment for a better life in the future (Sharma & Kushwaha, 2015).

Objectives

The study focuses on consumer behavior regarding the purchase of green durables and aims to understand their receptivity toward green products. The primary objective of the study is to assess consumers' awareness of green durables, specifically for selected products. The study's specific objectives include: 1) To examine the elements affecting consumers' perceptions of buying environmentally friendly durables 2) To investigate consumers' attitudes on the actual purchase of environmentally friendly durables

Research Methodology and Data

The study employs an empirical quantitative approach to investigate consumer perceptions toward green consumer durables. Primary data was gathered through a survey method, enabling statistical testing of the proposed hypotheses. The research is grounded in the Technology Acceptance Model (TAM), examining how perceived utility, perceived usability, and perceived risk influence attitudes toward environmentally friendly consumer durables and actual purchasing behavior. A pilot study involving 50 respondents helped refine a structured 12-item questionnaire, which was then administered both online and offline to a randomly selected sample of 400 respondents (64% male, 34% female). Responses were measured on a five-point Likert scale to assess key behavioral factors. Data analysis was conducted using Structural Equation Modeling (SEM), with Cronbach's Alpha to test reliability, Confirmatory Factor Analysis (CFA) for validity, and regression analysis to test hypothesized relationships and determine statistical significance. While the study provides valuable insights, it has some limitations, including its geographic focus on Karnataka, India, and the lack of segmentation based on specific product types.

Table 1

Cognizance about Green Consumer Goods

	Percent
Reprocessed products	63.8
Rechargeable batteries	71.2
Water saving soaps /Low fume paints	24.6

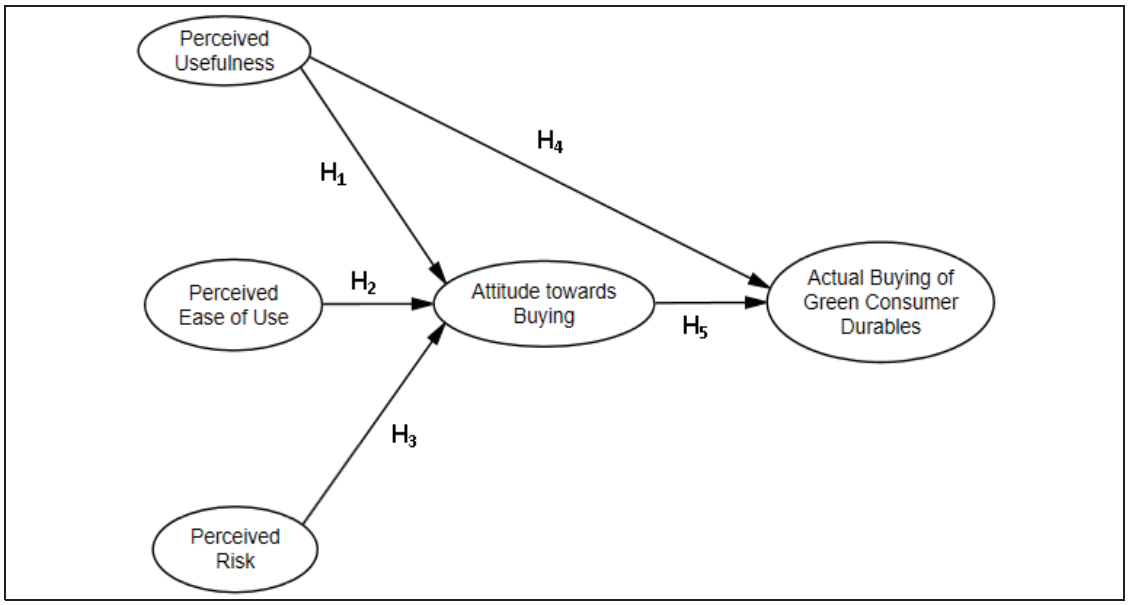
Note: since the response format given to the respondents is of Multiple choice, the total percentage is beyond 100.

Table 1 shows that 63.8 percent of respondents are aware of recycled products and 71.2 percent have the knowledge of replenishable batteries when it comes to Green Consumer goods. Surprisingly, just 24.6 percent of people know about low-fume paints and water-efficient soaps, which are part of the green customers goods category.

Research Model

Figure 1

Personalized TAM Model for The Goal Of Purchasing Environmentally Friendly Consumer Durables



A research model or framework postulated is presented in Fig-1. Technology Acceptance Model (TAM) is the basis of this framework. As a result, three constructs or determinants that are informational in nature, namely Perceived Usefulness, Perceived Ease of operation, and Perceived Risks would be transformed into a favorable outlook on purchase behavior. Furthermore, this mindset is projected to convert into a genuine desire to buy green consumer durables. A few hypotheses are addressed against this backdrop, and statistical significance is tested using defined hypothesis.

Research Question

In what ways do perceive efficacy, perceived ease of use, and perceived risk affect consumer attitudes and actual purchasing behavior regarding green consumer durables?

Research Hypotheses

H_1: The attitude toward purchasing green consumer durables is positively and significantly influenced by perceived usefulness.

H_2: Perceived ease of use significantly and favourably affects attitudes on the purchase of green consumer durables.

H₃: The attitude toward purchasing green consumer durables is significantly and negatively impacted by perceived risk.
H₄: The actual purchase of green consumer durables is positively and significantly impacted by perceived usefulness and
H₅: Attitude towards buying results in actual buying of *Green Consumer Durables.*

Empirical Analysis and Results

The table below, titled "Authenticity and Variable Loadings Establish the CFA for Measurement Model," presents the results of the confirmatory factor analysis (CFA), highlighting the authenticity of the constructs and the variable loadings that validate the measurement model.

Table 2
Authenticity and Variable Loadings Establish the CFA for Measurement Model

Dimension	Item/Indicators	Loading	CR	CA	AVE
Perceived Usefulness	More recycled batteries would aid in the efficient use of environmentally hazardous raw materials for batteries (PER_UFLN_1)	0.740	0.72	0.72	0.46
	The use of ozone-friendly products results in lower maintenance costs (PER_UFLN_2)	0.682			
	Low-fume paints are safer for your health (PER_UFLN_3)	0.613			
Perceived ease of Use	It is not always straightforward to process recycled products and dispose of batteries (PER_ESU_1)	0.689	0.76	0.77	0.52
	It is not always easy to harvest/manufacture ozone-friendly items (PER_ESU_2)	0.715			
	Low-fume paints and water-efficient soaps are out of reach for most people (PER_ESU_3)	0.748			
Perceived Risk	When compared to non-green product durables, performance loss is substantially larger (PER_RISK_1)	0.687	0.69	0.70	0.53
	Low-fume paints and water-saving soaps may not always produce satisfactory results (PER_RISK_2)	0.764			
Perspective towards buying	Because branded eco-friendly products aren't readily available, I favor non-green durables (ATTIT_1)	0.685	0.66	0.67	0.50
	The cost of products influences my decision to purchase green consumer durables (ATTIT_2)	0.724			
Actual buying of	Despite being worried about the environment, the current scenario does not	0.673	0.67	0.68	0.51

consumer green durables	favor using green products for long-term use (ACT_BUY_1)				
	Despite my optimistic attitude toward environmental issues, I am pessimistic when it comes to purchasing green durables (ACT_BUY_2)	0.764			

Notes: CR - Composite Reliability, CA - Cronbach Alpha, AVE – Average Variance Explained

Table 3
Discriminant Validity of the Measurement Model

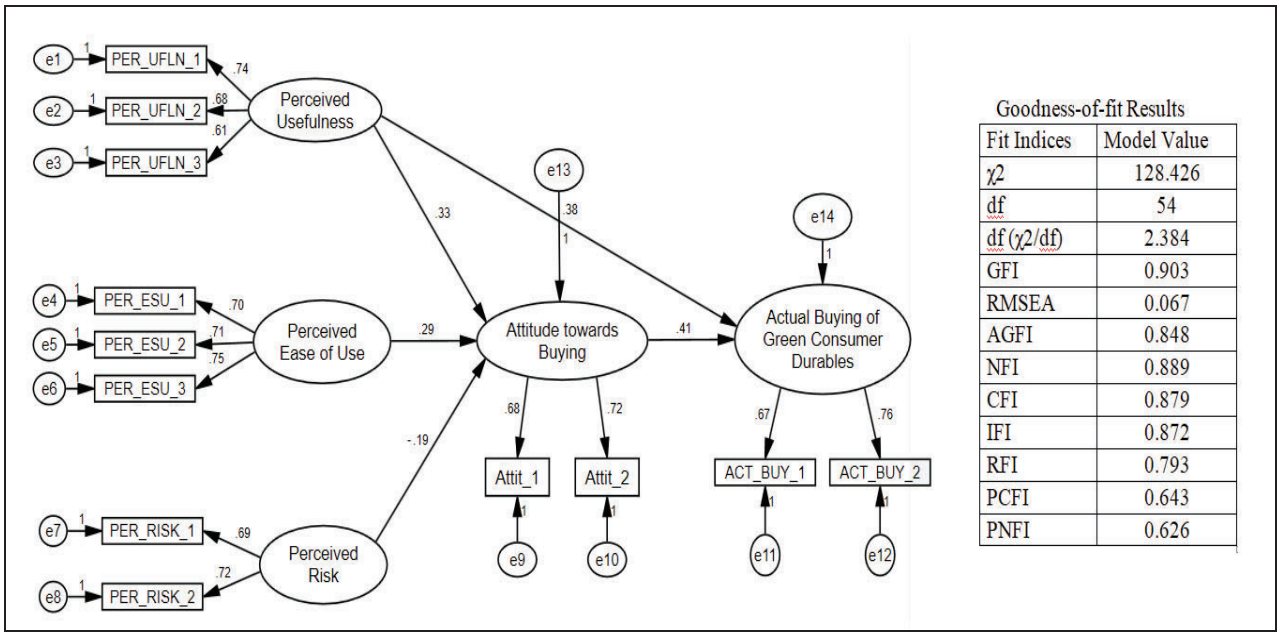
	PER_UFLN	PER_ESU	PER_RISK	ATTIT	ACT_BUY
PER_UFLN	0.680*				
PER_ESU	0.568	0.722*			
PER_RISK	-0.263	-0.167	0.729*		
ATTIT	0.317	0.290	- 0.179	0.710*	
ACT_BUY	0.381	0.467	-0.245	0.396	0.714*

* Square Root of AVE values shown in Table 2

The results of Cronbach's alpha, presented in Table 2, indicate an acceptable level of consistency and stability for the tests, measures, and instrument. Additionally, Table 1 highlights that all items have loadings greater than 0.50, confirming convergence validity, while the Cronbach's alpha values for each dimension exceed the acceptable threshold of 0.60. Similarly, the Divergent Validity results in Table 3 demonstrate that the five dimensions do not overlap, confirming they are not affected by collinearity issues.

SEM (Structural Equation Model)
SEM is used to examine the linear Contingent association among variables. The groundwork was tested with Primary data by using SEM result.

Figure 2
SEM Model Result for Actual Purchasing of Green Consumer Goods



Goodness-of-fit Results

Fit Indices	Model Value
χ2	128.426
df	54
df (χ2/df)	2.384
GFI	0.903
RMSEA	0.067
AGFI	0.848
NFI	0.889
CFI	0.879
IFI	0.872
RFI	0.793
PCFI	0.643
PNFI	0.626

Table 4
Direct Impact of Explanatory Model: Systematized Regression Weights

Association between Autogenous and Endogenous			Standard Estimate	S.E.	C.R.	P-value
Attitude towards buying	<---	Perceived usefulness	0.326	0.073	2.267	0.032*
Attitude towards buying	<---	Perceived ease of use	0.294	0.084	2.536	0.018*
Attitude towards buying	<---	Perceived risk	- 0.183	0.035	-2.117	0.042*
Genuine acquisition of Green Durables	<---	Perceived usefulness	0.385	0.106	2.893	0.013*
Factual purchase of Green Durables	<---	Attitude towards Green Products	0.412	0.058	3.023	0.006*

* Significance at 5 % level

The outcome of the regression analysis is furnished in Table 4. Correspondingly, it is apparent that the p-value of the correlation between Perceived usefulness and view point towards acquiring (ß=0.326, C.R = 2.267, p<0.05) is lower than the considerable alpha level of 0.05, we acknowledge H_1 and draw the inference that *Perceived usefulness* is definitely related *to frame of mind towards purchasing Green Consumer durables*. **Interpretation:** for every unit expands in the assessment scale of concurrence on the Perceived usefulness establishes, consumers' attitudes toward buying

Green Consumer Goods will increase by 0.326 times (32.6 %). In addition, it is experienced that Perceived ease of use has a remarkable productive connection with positivity towards purchasing (ß =0.294; CR= 2.536, p<0.05), hence, H_2 could be asserted. Alternatively, *estimated risk* has a significant negative relationship with Attitude towards purchasing (ß = - 0.183; CR= - 2.117, p<0.05), Perceived usefulness has a substantial productive relationship with Actual acquiring of green consumer goods (ß =0.385; CR= 2.893, p<0.05), and finally an optimistic approach towards buying has a notable pragmatic connection with Actual purchasing of green customers durables (ß =0.412; CR= 3.023, p<0.05).Thus, hypotheses H_3, H_4 and H_5 are asserted.

Discussion and Policy Implications

To start with, despite knowing the benefits of using green durables daily, the regression estimates for the relationship between perceived usefulness and attitude towards purchasing green durables shows that only about three consumers for every ten new customers will likely show a positive inclination towards the purchase which is in accordance with the published reports (Tian et al., 2022). The study also holds for the influence of perceived usefulness on actual intentions of buying green durables with only about four consumers (ß =0.385) for every ten new consumers are likely to adopt despite knowing its direct usefulness. As a result, it is naive to conclude that the majority of consumers within the sample geographical area in relation to the green durables products are hesitant to express Interestingly whether this would translate into actual buying of green durables it appears that with only four consumers (ß =0.412) for each new ten consumers are really interested in purchasing the green durable They will therefore be critical for implementing agencies (governments, NGOs) to ensure that real implementation is not a failure. Doing this will raise awareness of the importance of using more green durables through all available means of dissemination (print media, social media, etc.) in order to ensure that a large segment of society adopts more.

Consumers recognize the benefits of green durables but hesitate to purchase due to usability concerns (= 0.326 for usefulness, = 0.294 for ease of use). Companies must focus on product design and innovation to enhance user convenience. Improve the performance and function of green durables. Develop multi-purpose or hybrid green products that provide both sustainability and efficiency. Communicate benefits of products clearly through labeling and marketing materials. Cost concerns significantly impact buying decisions despite a positive attitude toward green durables (H5 supported). Organizations should adopt competitive pricing strategies and price-effective production models. Implement tiered pricing models (e.g. basic, premium and eco-luxury options). Partner with governments for subsidies or tax incentives to make products more affordable. Offer bundled promotions where green products are sold alongside conventional ones at a discount with green products not included. Green durables are not as widely available as non-green alternatives, and this limits adoption due to concerns about perceived ease of use. Companies must expand distribution networks and enhance supply chains to improve accessibility.

Increase availability of green durables in local retail stores and e-commerce platforms. Introduce direct-to-consumer (DTC) sales models to reduce intermediary costs. Develop strategic partnerships with retailers to create dedicated green product sections for their grocers' shelves. The perceived risk negatively impacts attitude toward buying green durables (= -0.183, p 0.05). Companies need to eliminate doubts about product effectiveness through guarantees and quality assurance. Offer extended warranties and return policies for green durables. Provide performance comparisons between green and non-green alternatives. Invest in third party certifications (e.g. Energy Star, EcoLabel) to validate product claims.

Organizations must shift their focus from awareness-building to conversion-driven campaigns. They should utilize behavioral marketing tactics such as limited-time discounts and personalized recommendations and implement loyalty programs that reward customers for sustainable purchases. Leveraging influencer marketing and brand ambassadors can also enhance credibility. Companies must integrate sustainability goals into their corporate vision and operations, setting measurable targets such as carbon neutrality or zero waste. They should adopt environmentally friendly manufacturing processes and ensure transparent reporting. Aligning with environmental, social, and governance (ESG) criteria can attract ethical investors. Additionally, companies should actively engage policymakers and industry associations to drive green initiatives, participate in public-private partnerships for sustainable product development, and advocate for eco-labeling mandates to standardize green product claims. Collaboration with non-profits and sustainability groups can further enhance credibility. The results of the present study support previous research (Anser et al., 2020; Ashfaq et al., 2021; Shahzad et al., 2022).

Findings

Building on the analysis of consumer perceptions and behaviors, the following findings provide key insights into the factors influencing the adoption of green durables.

- The findings suggest that while an increasing percentage of people acknowledge the existence of environmental issues and green consumer products, their purchasing behavior remains relatively low.
- **Perceived Usefulness (PU):** Consumers recognize the utility of green durables but do not translate this perception into action.
- **Perceived Ease of Use (PEU):** Many customers find it difficult to locate or use green durables.
- **Perceived Risk (PR):** Concerns about the competence and reliability of green products deter purchases.

The study revealed a positive correlation between perceived usefulness and actual buying behavior, yet many consumers still hesitate to make a purchase despite having a favorable attitude toward green products.

Significance

The study emphasizes that increasing consumer adoption of green durable products is crucial for reducing environmental degradation by promoting sustainable consumption practices. Businesses may create more successful marketing campaigns and product positioning by having a better understanding of the factors that influence and hinder consumers' decisions to buy environmentally friendly durable goods. As long as companies can get past acceptance hurdles, the green durable market is a new one with enormous growth potential. Through regulations, incentives and awareness programs policymakers play a crucial role in driving the adoption of green durables. The study highlights that consumer awareness and cultural shifts to sustainability are growing especially among educated buyers. This study is important in understanding why consumers hesitate to purchase green durables despite being environmentally aware. Across industries and stakeholders, the findings reinforce the need for a multi-stakeholder approach involving businesses, policymakers and environmental organizations to address the intention action gap through better product accessibility pricing and risk reduction strategies.

Conclusion

This study has examined how ecological concerns, along with social and economic sustainability, influence participants' intentions to purchase durable goods. The findings indicate that perceived usefulness positively impacts consumers' buying behavior towards green durables, as they view the usage of such products as more productive. However, perceived ease of use reveals that manufacturing recycled and ozone-friendly products, and making them accessible to customers, remains a challenge. Green goods require advanced technology for production, and marketing them effectively is difficult. When compared to non-green durable products, the perceived risk shows that green durables perform well and yield satisfactory results. The attitude towards purchasing green durables often leads customers to compare them with non-green alternatives, which are more readily available in the market. Cost remains a key consideration for green durables.

As awareness about sustainability increases among educated buyers, there is a growing tendency to opt for green durables. However, despite a favorable attitude toward environmental issues, consumers are reluctant to purchase green durables due to factors such as limited availability of branded green products, higher pricing, and concerns about long-term utility and lifespan. Therefore, businesses must focus on promoting green durables with strong branding, competitive pricing, and effective promotional strategies.

This study focused primarily on consumer attitudes towards green durables. Future research could expand to explore both demand-side and supply-side perspectives, comparing the benefits of green production and consumption. Additionally, a deeper focus on the ecological aspect from an environmental perspective is warranted. There is also a need for increased government and non-government initiatives, alongside environmental group-led social movements, to raise awareness among consumers about the three Rs of sustainability: reduce, reuse, and recycle. The ultimate goal should be to prevent waste and conserve natural resources.

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