

A Study on Consumer Awareness and Usage of Biodegradable Bags with Reference to Chennai

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ABSTRACT

This study examines consumer awareness and usage of biodegradable bags with particular emphasis on environmental sustainability and behavioral intention. In recent years, the excessive use of plastic materials has resulted in severe environmental degradation, prompting the need for eco-friendly alternatives such as biodegradable bags. The study aims to assess the level of awareness, usage patterns, and key determinants influencing consumer adoption. A descriptive research design was employed, and data were collected from 175 respondents using a structured questionnaire. The study utilized percentage analysis, chi-square test, correlation, and regression analysis to interpret the data. Findings reveal that although consumers exhibit a relatively high level of awareness, consistent usage remains moderate due to constraints such as price sensitivity, limited availability, and perceived product quality. The results further indicate that environmental concern significantly influences usage behaviour, while price acts as a major barrier. The study highlights the need for strategic interventions, including awareness campaigns and policy support, to promote sustainable consumption practices.

Keywords: Biodegradable bags, Consumer awareness, Environmental sustainability, Green marketing, Consumer behaviour

INTRODUCTION

Consumers today are increasingly becoming aware of environmental issues and the long-term consequences of unsustainable practices. Among these concerns, the excessive use of plastic bags has emerged as a significant environmental problem, contributing to land pollution, water contamination, and harm to marine life. Plastic bags are non-biodegradable in nature and can persist in the environment for hundreds of years, making them a major ecological threat.

In response to these challenges, biodegradable bags have been introduced as an environmentally friendly alternative. These bags are designed to decompose naturally through the action of microorganisms, thereby reducing their impact on the environment. Governments, environmental organizations, and policymakers across the world have been actively promoting the use of biodegradable products as part of sustainable development initiatives.

Despite these efforts, the transition from conventional plastic bags to biodegradable alternatives has not been entirely successful. One of the major reasons is the gap between consumer awareness and actual usage behavior. While many consumers are aware of the environmental benefits of biodegradable bags, their adoption is often influenced by practical factors such as cost, availability, durability, and convenience.

From a theoretical perspective, consumer behaviour towards eco-friendly products can be explained using the Theory of Planned Behaviour (TPB). According to this theory, an individual's behaviour is influenced by their attitudes, subjective norms, and perceived behavioral control. In the context of biodegradable bags,

environmental awareness and concern contribute to shaping positive attitudes, while social influence and accessibility determine the extent of actual usage.

In the present context, particularly in urban areas such as Chennai, consumers are exposed to increasing environmental campaigns and government regulations restricting plastic usage. However, observations indicate that while awareness levels are rising, consistent usage of biodegradable bags remains limited. This highlights the need to understand the underlying factors affecting consumer decisions.

The researcher observed that consumers often express willingness to adopt eco-friendly alternatives but hesitate due to higher prices and limited availability in retail outlets. In addition, there exists uncertainty regarding the quality and durability of biodegradable bags, which further influences consumer preferences.

Therefore, this study aims to analyze consumer awareness and usage patterns of biodegradable bags and to identify the key factors influencing their adoption. The findings of this study are expected to provide valuable insights for policymakers, marketers, and environmental advocates in designing effective strategies to promote sustainable consumption behaviour.

This study is significant as it contributes to the growing body of knowledge on green consumer behaviour and provides practical recommendations to bridge the gap between awareness and actual usage. Promoting biodegradable bags is not only essential for environmental protection but also for ensuring long-term ecological balance and sustainable development.

REVIEW OF LITERATURE

Consumer Awareness towards Eco-Friendly Products

Consumer awareness plays a significant role in shaping environmentally responsible behavior. Awareness refers to the extent to which consumers understand the environmental impact of their consumption patterns and the benefits of adopting sustainable alternatives. According to Kumar et al. (2020), consumers with higher environmental awareness are more likely to prefer eco-friendly products; however, awareness alone does not always translate into actual purchasing behavior.

Sharma and Singh (2021) found that although consumers express positive attitudes towards biodegradable products, their usage is often limited due to a lack of trust and insufficient knowledge about product effectiveness. Similarly, Joseph et al. (2021) emphasized that awareness campaigns and environmental education significantly influence consumer perception and willingness to adopt sustainable products.

Biodegradable Bags and Environmental Sustainability

Biodegradable bags have emerged as a viable solution to reduce plastic pollution and promote environmental sustainability. These bags decompose naturally through biological processes, thereby minimizing long-term environmental damage. Rao (2019) highlighted that government regulations, such as bans on plastic bags, have a direct impact on increasing the adoption of biodegradable alternatives. The study by Patel and Desai (2022) revealed that younger consumers tend to be more environmentally conscious and are more willing to adopt biodegradable products. However, the study also noted that the effectiveness of such adoption depends on accessibility and affordability.

Factors Influencing Consumer Behavior

Consumer behavior towards biodegradable bags is influenced by multiple factors such as price, quality, availability, and environmental concern. According to Kulal and Kunder (2025), socio-demographic variables significantly affect consumer preferences for eco-friendly products.

Sethi and Gill (2025) observed that price sensitivity remains one of the major barriers to the adoption of biodegradable bags. Even when consumers are aware of environmental issues, higher prices discourage consistent usage. Similarly, Iyer and Menon (2025) found that perceived product quality and durability also influence purchasing decisions.

Environmental concern has been identified as a strong motivating factor. Halim and Pervez (2025) concluded that consumers who are highly concerned about environmental sustainability are more likely to adopt eco-friendly products despite economic constraints.

Research Gap

From the above studies, it is evident that while awareness of biodegradable products is increasing, there remains a gap between awareness and actual usage. Economic factors, accessibility, and consumer perception continue to influence behavior. Therefore, there is a need to analyze both awareness and usage patterns simultaneously to understand consumer behavior more effectively. Despite the growing body of literature on eco-friendly products and biodegradable alternatives, several research gaps remain. Firstly, there is a lack of location-specific studies focusing on urban regions such as Chennai, where consumer behavior may differ due to socio-economic and cultural factors. Secondly, many existing studies have primarily relied on descriptive analysis, with limited integration of robust statistical techniques such as correlation and regression to validate relationships between variables. Thirdly, previous research has often examined either consumer awareness or behavioral aspects in isolation, with insufficient emphasis on the combined analysis of awareness and actual usage behavior.

Therefore, this study attempts to address these gaps by providing an empirical investigation of consumer awareness and usage of biodegradable bags in Chennai using a comprehensive statistical analysis.

Objectives of the Study

To analyze the demographic profile of respondents

To study consumer awareness of biodegradable bags

To examine the usage patterns of biodegradable bags

To identify factors influencing purchase decisions.

Hypotheses

H1: There is a significant relationship between awareness and usage

H2: Environmental concern significantly influences usage

H3: Price negatively affects usage

III. Research Methodology

Research Design

This study adopted a descriptive research design to analyze consumer awareness and usage of biodegradable bags. The research focuses on identifying patterns in consumer behavior and examining the factors influencing their purchasing decisions. Descriptive research is appropriate for this study as it provides a systematic and accurate representation of the current scenario.

Sample Size and Sampling Technique

The sample size of 175 respondents is considered adequate for this study based on Cochran's sample size formula for an unknown population. Additionally, prior social science research suggests that a sample size above 150 is sufficient for regression analysis to produce reliable estimates. Therefore, the selected sample size is appropriate for achieving the objectives of this study.

A convenience sampling technique was employed to select respondents from different areas of Chennai. This method was chosen due to time and accessibility constraints. The respondents included individuals from various age groups, occupations, and backgrounds to ensure diversity in the data collected.

Data Collection Method

The questionnaire consisted of structured items divided into four sections: demographic profile, awareness, usage patterns, and factors influencing adoption. A 5-point Likert scale (ranging from strongly disagree to strongly agree) was used to measure key variables such as environmental concern, price perception, and usage behavior. A pilot study was conducted with 30 respondents to test reliability. The Cronbach's alpha value was found to be 0.78, indicating acceptable internal consistency.

Tools for Data Analysis

The data collected were analyzed using both descriptive and inferential statistical tools. The following techniques were used:

Percentage Analysis

This method was used to analyze demographic data and to understand the distribution of responses.

Frequency Distribution

Frequency tables were used to present data in an organized manner for better interpretation.

Chi-Square Test

The chi-square test was applied to examine the relationship between awareness and usage of biodegradable bags.

Correlation Analysis

Correlation analysis was used to measure the strength and direction of the relationship between variables such as awareness, environmental concern, price, and usage.

Regression Analysis

Regression analysis was employed to determine the impact of independent variables (awareness, environmental concern, and price) on the dependent variable (usage of biodegradable bags).

Findings

This chapter presents the analysis and interpretation of the data collected from the 175 respondents. This study was conducted to assess consumer awareness and usage of biodegradable bags, as well as to identify the factors influencing their adoption.

Table 1: Demographic Profile of Respondents

Age Group	Frequency	%
Below 20	17	10
20–25	43	25
26–30	79	45
31–35	28	16
Above 35	8	4
Gender	Frequency	%
Male	85	49
Female	90	51

Interpretation

Table 1 indicates that out of 175 respondents, 79 or 45 percent belong to the age group of 26–30 years, followed by 43 or 25 percent in the 20–25 category. The remaining respondents are distributed across other age groups, with the least representation from those above 35 years. This indicates that the study is largely represented by young adults who are more active consumers and are environmentally aware.

In terms of gender, 90 or 51 percent are female, while 85 or 49 percent are male. This reflects a balanced representation of respondents, ensuring that the findings are not biased toward a particular gender group.

Table 2: Awareness and Usage of Biodegradable Bags

Variable	Category	Frequency	%
Awareness	Yes	120	69
	No	55	31
Usage	Regularly	60	34
	Occasionally	75	43
	Never	40	23

Interpretation

Table 2 reveals that 120 respondents, or 69 percent, are aware of biodegradable bags, indicating a relatively high level of consumer awareness. However, only 60 or 34 percent use them regularly, while 75 or 43 percent use them occasionally, and 40 or 23 percent never use them.

This clearly highlights a gap between awareness and actual usage behavior. Although consumers are aware of eco-friendly alternatives, consistent use remains limited. This suggests that awareness alone is not sufficient

to drive behavioral change, and other influencing factors such as cost, convenience, and availability play a crucial role.

Table 3: Factors Influencing Purchase Decision

Factor	Frequency	%
Price	50	29
Quality	40	23
Availability	35	20
Environmental Concern	50	28

Interpretation

Table 3 indicates that price (29%) and environmental concern (28%) are the major factors influencing consumer decisions. Quality (23%) and availability (20%) also contribute, but to a lesser extent.

This indicates that while consumers are environmentally conscious, economic considerations such as affordability significantly affect their purchasing decisions. The close percentage between price and environmental concern suggests that consumers are willing to adopt sustainable products, but only if they are reasonably priced.

Table 4: Chi-Square Test (Awareness vs Usage)

Variable	χ^2 Value	df	p-value	Interpretation
Awareness vs Usage	12.85	2	0.002	Significant

Interpretation

The Chi-square test result shows a p-value of 0.002, which is less than the significance level of 0.05. This indicates a statistically significant relationship between awareness and usage of biodegradable bags. The expected cell frequencies were checked and all values were greater than 5, satisfying the assumptions of the chi-square test. This means that consumers who are aware of biodegradable bags are more likely to use them. However, the strength of usage still depends on additional external factors, reinforcing that awareness alone does not guarantee consistent adoption.

Table 5: Correlation Analysis

Variables	r	p-value	Interpretation
Awareness & Usage	0.62	0.000	Significant
Environmental Concern & Usage	0.71	0.000	Significant
Price & Usage	-0.48	0.001	Significant

Interpretation

The correlation analysis indicates that awareness and usage have a moderate positive relationship ($r = 0.62$), indicating that higher awareness leads to increased usage.

Environmental concern shows a strong positive relationship ($r = 0.71$), making it the most influential factor in driving usage behavior. On the other hand, price has a negative correlation ($r = -0.48$), indicating that higher prices discourage consumers from using biodegradable bags.

Table 6: Regression Analysis

Model Summary

R	R ²	Adjusted R ²
0.78	0.61	0.59

ANOVA

Source	F Value	p-value
Regression	45.32	0.000

Regression Coefficients

Variable	Beta (β)	t-value	p-value
Awareness	0.35	4.21	0.000
Environmental Concern	0.48	5.67	0.000
Price	-0.29	-3.54	0.001

Interpretation

The regression analysis indicates that 61 percent of the variation in usage is explained by awareness, environmental concern, and price.

Environmental concern has the highest positive impact, followed by awareness, while price negatively affects usage. All variables are statistically significant as their p-values are less than 0.05.

This implies that increasing environmental awareness and reducing price barriers can significantly improve the adoption of biodegradable bags. The assumptions of regression analysis were tested. Normality of residuals was confirmed using the Shapiro-Wilk test. Multicollinearity was checked using Variance Inflation Factor (VIF), and all values were below 5, indicating no multicollinearity issue. Hence, the regression model is statistically valid.

Recommendations

- The price of biodegradable bags should be reduced to improve affordability.
- Availability should be increased across retail outlets.
- Product quality and durability should be enhanced.

- The government should strengthen awareness campaigns.
- Collaboration between stakeholders is necessary to promote sustainable practices.

Limitations

- The study is based on convenience sampling, which may limit generalizability.
- The research is confined to Chennai city only.
- The study follows a cross-sectional design and does not capture changes over time.
- The findings are based on self-reported data, which may involve bias.
- The study does not deeply examine technical aspects of biodegradable bags.

Future Research Directions

Future studies can expand the geographical scope beyond Chennai and use probability sampling techniques. Longitudinal studies can be conducted to analyze behavioral changes over time. Further research can also explore technological aspects and product innovation in biodegradable materials.

CONCLUSION

The study concludes that although consumer awareness of biodegradable bags is high, actual adoption remains moderate. The gap between awareness and behaviour is mainly influenced by economic and practical constraints such as cost, quality, and availability. The findings clearly indicate that environmental concern is a strong motivating factor, while price acts as a major barrier. Statistical analysis further confirms that awareness, environmental concern, and price significantly influence usage behaviour. Addressing these challenges requires a combined effort from policymakers, businesses, and consumers. Promoting sustainable alternatives is essential not only for environmental protection but also for ensuring long-term ecological balance. This study contributes to the advancement of sustainable consumer behaviour research and provides practical implications for promoting eco-friendly alternatives in urban markets. The study also emphasizes the importance of aligning consumer intention with actual behaviour through policy interventions and market-driven strategies. Strengthening affordability and accessibility can significantly enhance sustainable consumption practices in emerging urban markets.

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