From Awareness to Action: A Predictive Analysis of Green Consumer Preferences in FMCGs in West Bengal

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Abstract

The increasing global emphasis on sustainability has led to a transformation in consumer preferences, particularly within the Fast-Moving Consumer Goods (FMCG) sector. As concerns regarding environmental degradation intensify, consumers are becoming more perceptive of the ecological implications of their purchasing decisions, resulting in a growing demand for environmentally responsible products. In this context, it is imperative to examine the determinants that influence consumer preferences for green FMCGs, enabling businesses to formulate effective market strategies.

This study employs predictive analysis within the Knowledge-Attitude-Practice (KAP) framework to explore the relationship between demographic variables-age, education, and gender-on consumer preferences for sustainable FMCG Products in West Bengal. A structured questionnaire was used to gather data, followed by regression analysis to examine the relationships between key variables influencing green buying practices. The findings indicate that educational background plays a more significant role than age in shaping consumer awareness and understanding, which ultimately affects purchasing decisions. Additionally, gender emerges as a crucial factor, with women showing a greater willingness to spend more on sustainable products compared to men.

This study contributes to the existing body of knowledge on eco-friendly consumer behaviour and offers practical insights for businesses, policymakers, and marketing professionals. Understanding demographic factors enables companies and regulatory bodies to identify the key drivers behind eco-friendly purchasing decisions. This insight helps in crafting more effective awareness campaigns and marketing strategies that promote a wider adoption of sustainable consumption. Consequently, consumer engagement in the green FMCG market can experience significant growth.

Introduction

Sustainability has become a key factor in consumer decision-making, particularly within the rapidly evolving fast-moving consumer goods (FMCG) sector. In recent years, a growing number of consumers have consciously chosen environmentally friendly FMCG products that aim to reduce ecological impact.

These products prioritize sustainable production, ethically sourced materials, and eco-friendly packaging (Peattie & Crane, 2005; Joshi & Rahman, 2015). Globally, awareness of environmental challenges—such as climate change, pollution, and resource depletion-has been steadily increasing (Gleim et al., 2013; White et al., 2019). This rising consciousness is reflected in shifting consumer preferences, with many actively seeking products that align with sustainability principles (Jaiswal & Kant, 2018). However, despite this increasing awareness, a gap persists between consumers' intentions and their actual purchasing behaviour. While many express a willingness to buy eco-friendly products, their final purchase decisions are often influenced by factors beyond environmental considerations, such as price, availability, and brand perception (Kim & Lee 2023).

This study explores the relationship between consumer demographics and environmentally friendly purchasing habits, with a particular focus on West Bengal's regional market dynamics. Unlike broader studies that examine green purchasing behaviour at a national or global level, this research acknowledges that cultural, economic, and social factors can vary significantly across regions. Understanding these local variations is essential for developing effective marketing strategies that align with consumer preferences and address potential barriers to sustainable consumption.

By identifying key factors that influence green purchasing decisions within the FMCG sector, businesses can craft more compelling value propositions that resonate with environmentally conscious consumers. Additionally, this research will provide valuable insights for policymakers, helping them design initiatives that encourage a transition toward a more sustainable consumer culture (White et al., 2019).

Objectives

This study aims to examine the key factors influencing consumer choices for environmentally friendly fast-moving consumer goods (FMCG) using the Knowledge, Attitude, and Practice (KAP) framework. The primary objectives of this research are:

1. To analyze the impact of age on consumer preferences for eco-friendly FMCG products.
2. To explore the relationship between educational background and the selection of green FMCG items.
3. To investigate gender-based differences in consumers' willingness to pay a premium for environmentally sustainable FMCG products.

4. To assess how product characteristics, such as ingredient transparency and manufacturing processes, influence consumer confidence and preferences for green FMCG options.

Literature Review

In recent years, consumers have increasingly prioritized environmental sustainability in their purchasing decisions, particularly within the fast-moving consumer goods (FMCG) sector. Growing awareness of the environmental impact of consumption has fuelled demand for eco-friendly products, which are designed to be less harmful to the environment and are often manufactured using sustainable methods that minimize ecological damage (Ottman 2011).

Several studies highlight that consumer knowledge, attitudes, and habits play a significant role in shaping purchasing decisions (Leonidou et al., 2010; Sharma & Jha, 2017). The Theory of Planned Behaviour (Ajzen, 1991) offers a valuable framework for understanding how individuals form perceptions about sustainability and how these perceptions influence their buying choices.

Studies show that if consumers understand environmental problems, they are likely to support green products. Many studies have used this theory to explain why people buy environmentally friendly FMCG products. Studies show that people with more environmental perception prefer to buy green products at higher costs (Chen & Chai, 2020). Studies show that education is very important for the development of environmentally friendly habits. Individuals with higher education are more likely to choose sustainable products, as they have a better understanding of environmental issues. Research suggests that environmental awareness has a positive influence on green purchasing decisions (Leonidou et al., 2010). Promoting awareness of environmental impact and the importance of sustainability enables consumers to make more informed choices when selecting eco-friendly products (Sharma & Jha, 2017).

A study by Chen & Chai (2020) also found that individuals with higher education levels are more inclined to opt for sustainable products, as they have a deeper understanding of how their choices affect the environment. This study suggests that environmental education plays an important role in providing more information. Education programs can help consumers learn more about sustainability. This allows you to encourage environmentally friendly FMCG products.

Studies have shown that gender affects consumer preference of environmentally friendly products. A study conducted by Kim & Choi (2019) found that women are generally more environmentally friendly

than men. This is because it focuses more on creating health, ethics and safer houses. In developed countries, women are likely to buy environmentally friendly FMCGs. Fear of family and ethical consumption in the family contribute to this choice. This results in important results for marketing. Gender marketing strategies can help increase sales of sustainable products. Emotional and social ties with environmental issues are the main factors related to the preference of women with green products (Naz et al., 2020). Personalized and emotional marketing can be especially effective in achieving achievement. The influence of age on environmentally friendly purchasing solutions is various. Young consumers, especially the Millennium generation and generation Z, are often recognized environmentally and are considered to be easy to buy green products, but the research on this demographic has resulted in conflicting results (Yadav & Pathak, 2016). Some studies have shown that young buyers affect the desire to monitor public pressure, influence of colleagues and stability, and other studies emphasize serious economic obstacles that interfere with the ability to allow more advantageous environmentally friendly objects. On the other hand, elderly consumers can, in principle, are able to make a better purchase that can be purchased at prices that are excellent in financial stability and rapidly changing consumer goods. Gazi et al., (2024) found that young consumers generally know more about environmental issues. But they often fight money to buy stable products. On the other hand, elderly consumers may not know about environmental issues. But they usually have more disposable income, so they can afford to buy green products. This shows that further research is needed to understand how age affects the purchase power. This study also highlights the complex factors influencing consumer choices regarding environmentally friendly FMCG products. Consumer confidence in ingredient transparency and labelling plays a pivotal role in green purchasing decisions. Buyers actively seek clear and reliable information regarding a product's ingredients, sourcing, and production processes to make informed choices.

Research by Dangelico and Pujari (2010) suggests that ingredient disclosure significantly influences consumer trust in green products. Customers are more likely to feel confident in their purchases when they perceive product claims as credible and verifiable. Various certifications-such as sustainable development labels, fair trade certifications, and eco-friendly tags-serve as essential tools in building consumer trust, ultimately increasing the likelihood of purchasing green products. However, trust in labelling can sometimes be affected by consumer misconceptions regarding a product's true environmental benefits (Fernandes et al., 2020). The growing demand for transparency and accountability places a significant responsibility on companies to ensure that their labelling accurately reflects a product's sustainability attributes (Dempere et al., 2024: Durmuş 2024). This highlights the

need for standardization and regulatory oversight in the green product market to prevent misleading claims and reinforce consumer trust. As research on green consumer behaviour evolves, it continues to uncover the complex interplay of factors that shape preferences for sustainable products (Efunniyi et al., 2024).

Initial research focused on awareness and relationships, but modern research focused on the complex relationships between demographic characteristics (including age, gender and education), psychological impacts (personal values, ethical considerations and health problems), and factors related to markets (e.g., prices, accessibility and information) (Serwinek 1992). The consistent results of the literature are emphasized as the main factors of consumer behaviour in the consumer goods direction (FMCG), which is rapidly changing as a result of education, gender and transparency, but the role of age remains the subject of controversy (Siddiqui et al., 2023). This understanding emphasizes the importance of studying how these variables interact in a specific context of FMCG's green consumption in West Bengal, where local and cultural nuances can play an important role in the formation of consumer choice. This study, which has expanded its previous research, affects the choice of environmentally friendly consumer consumers (FMCGs) that are rapidly developing in West Bengal in demographic factors such as age, education level and gender (Siddiqui et al., 2023). This study helps to create a more careful and effective marketing approach to predicting an understanding of the effects of these variables on consumers' decision -making and encouraging sustainable consumption.

Materials and Methods

Study Design and Sampling

This study adopted a quantitative research methodology to study how it affects consumer preferences of consumer goods (age, education, and gender), which develops rapidly developed consumer goods (age, education, and gender). To collect basic data, researchers used structured questionnaire. This study included a selected participant through a randomized sample of 211 participants from Western Bengal. This sampling method provides a variety of ages, educational levels, and a variety of respondents in the fields of expertise, so you can see a wide range of preference for environmental FMCG products.

Data Collection

The research methodology involved an online questionnaire distributed to 211 respondents via Google Forms, encompassing 30 questions. The survey utilized a mix of Likert-scale items, multiple-choice

queries, and open-ended questions to gather both quantitative and qualitative information. The questionnaire was structured around three principal components of the KAP (Knowledge, Attitudes, Practices) framework:

1. Knowledge: Assessing consumers' understanding of environmental concerns and eco-friendly FMCG alternatives.
2. Attitudes: Evaluating their views and readiness to embrace sustainable behaviours.
3. Purchasing Practices: Examining actual consumer buying habits, including the elements that shape their green FMCG purchasing decisions.

Statistical Analysis

Regression analysis was employed to examine the correlations between demographic variables (age, education, gender) and the elements of the KAP framework using the gathered information. To assess the model's performance, several metrics were utilized: R-squared was used to determine the percentage of variance explained by the model; Adjusted R-squared was applied to consider the number of predictors, ensuring model precision; and Standard Error was employed to measure the typical deviation of observed values from the regression line.

Results

Regression Analysis Results for Eco-Friendly Consumer Goods Preferences

The table below illustrates the regression model summary, highlighting the correlations between different variables and consumer inclinations towards environmentally friendly fast-moving consumer goods (FMCG):

Model	R	R Square	Adjusted R Square	Std. Error
Age Influence	0.325	0.106	0.089	1.221
Education Influence	0.516	0.267	0.245	1.118
Gender Influence	0.653	0.427	0.390	1.036
Ingredient Labels	0.736	0.542	0.510	0.785

Table: 1: Impact of demographic factors on green FMCG choices—ingredient labels show the highest influence, followed by gender and education, while age has the least effect.

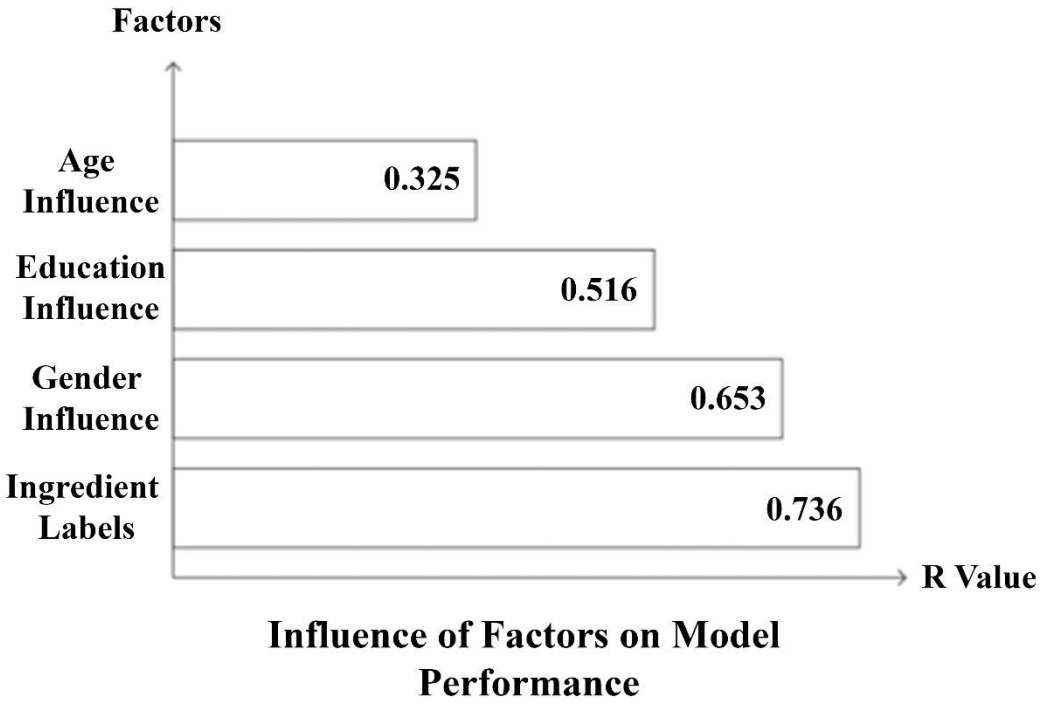

Figure 1: Consumers trust transparency—ingredient labels (R = 0.736) shape green choices the most. Gender (R = 0.653) and education (R = 0.516) also guide decisions, while age (R = 0.325) plays a smaller role. Sustainability starts with informed choices.

Regression Analysis Report

Regression analysis provided the following observations: 1. Effect of age: The result shows a medium correlation between age and preference for green products FMCG (r = 0.325) (Refer Figure 1). This means that age is about 10.6%of the volatility of consumer choice for environmentally friendly objects, which means that the influence of age on green solutions is limited. 2. The role of education: The regression model showed a stronger relationship with education with the value of R-Square 0.267 (r = 0.516) (Refer Figure 1). This explains about 26.7% of the differences related to consumers, emphasizing the importance of knowledge and perception in encouraging stable consumption habits. 3. The effect of sex: The study found the most reliable relationship on the floor with the value of 0.427 R-square (r =

0.653) (Refer Figure 1). This gender has a significant impact on paying more costs for stable products, and in general, women tend to be more environmentally friendly than men. 4 Component Label: The component variable shows the most R-quadrate of 0.542, which indicates that the consumer's confidence in the indication of the ingredient describes 54.2% (Refer Table 1) of the change in the purchase of green products. This emphasizes the important role of labelling transparency in the formation of consumer trust and the possibility of purchasing green FMCG (Refer Figure 2).

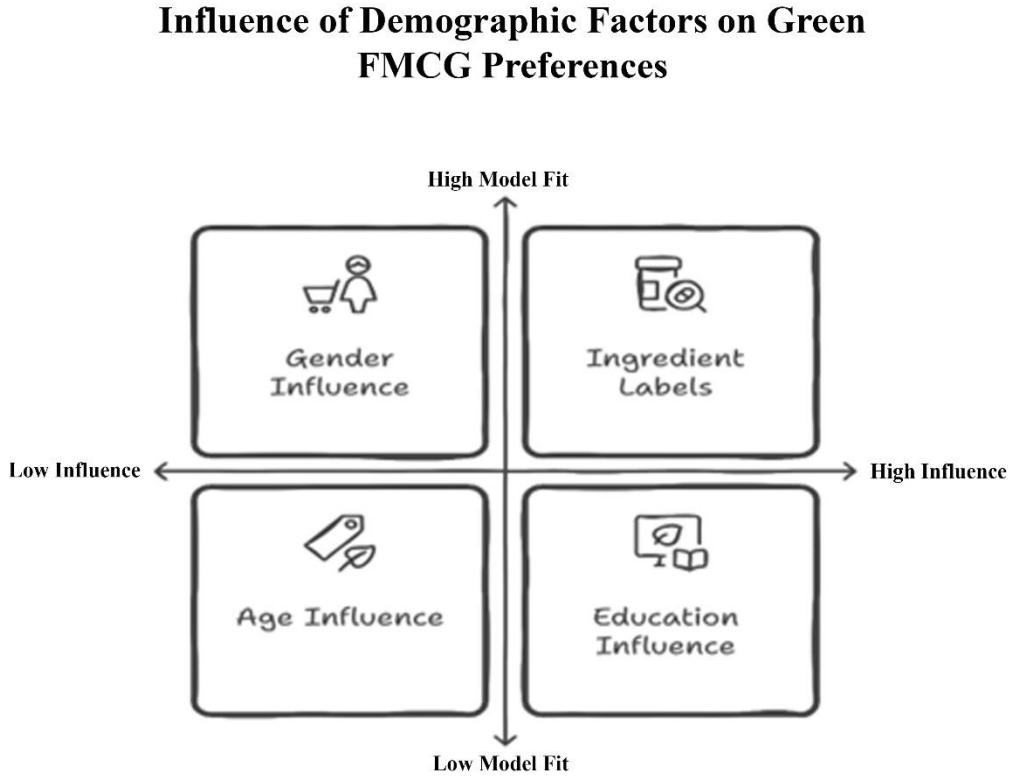

Figure 2: Quadrant analysis highlights key drivers of green FMCG choices. Clear ingredient labels strongly influence decisions with high model fit, while gender and education show varying impacts. Age plays the smallest role, suggesting that sustainability choices transcend generations.

Discussion

Descriptive Statistics-Linear Regression with Model Fit Interpretation

1.) Dependent Variable: Age

a. Predictors: (Constant),

b. Dependent Variable: AGE

1. Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.570[a]	.325	.201	1.222

Table 2: Model summary highlights the predictive strength—R = 0.570 indicates a moderate correlation, while $R^2 = 0.325$ shows that 32.5% of the variation in green FMCG choices is explained. Adjusted $R^2 = 0.201$ refines this estimate, with a standard error of 1.222.

Chemical-free edible oil consumption, concern about organic or chemical-free edible oil, shampoo pricing, and taste preferences are not influenced by age. The model's R-squared (R^2) value of 0.325 suggests that the independent variables (preference for chemical-free/organic products and shampoo pricing) account for roughly 32.5% (Refer Table 2) of the variance in the dependent variable (brand selection). The Adjusted R-squared value, which is 0.201 (Refer Table 2), provides a more precise measurement by accounting for the number of predictors. Both these values fall short of the widely accepted 0.5 threshold, with the R-squared at 0.325 and the Adjusted R-squared at 0.201 (Refer Table 2), which is below the satisfactory level of 0.5.

2.) Dependent Variable: Education

2. Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.718[a]	.516	.427	1.118

a. Predictors: (Constant),

b. Dependent Variable: Education level

Table 3: Model Summary Highlighting the Relationship Between Predictors and Education Level, Explaining 51.6% of Variance with a Strong Correlation (R = 0.718).

The level of education shows the selection and strong connection of environmentally friendly cooking oils and understands the advantages of hair and scalp treatment, general health status and lifestyle choices. This compound is confirmed by 0.516 (Refer Table 3) definition coefficient (r^2), which indicates that about 51.6% (Refer Table 3) of the differences in environmentally friendly food oil selection can be explained by factors such as education, age, floor and work. The adjusted definition coefficient (adjusted Râ²) 0.427 further checks the accuracy of the model, taking into account the number of predicted variables used.

3.) Dependent Variable: Gender

3.Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.808[a]	.653	.590	1.036

a. Predictors: (Constant),

b. Dependent Variable: Gender

Table 4: Overview of the Model's Strength in Explaining Gender Variability, with 65.3% of the Variance Accounted for and a Strong Correlation (R = 0.808).

According to statistical analysis, the floor plays a decisive role in various consumer behaviour related to personal hygiene products. This behaviour includes the willingness to pay more for oils without chemicals, the treatment level of potentially harmful substances (e.g., sulphate, parabens and sodium chloride) in shampoo, and the importance of environmental alignment. The strength of this relationship is proved by statistical indicators: R-square (r^2) 0.653 (Refer Table 4) is suggested that it is about 65.3%of the variations observed by the gender. In addition, the adjusted value of the R-Square 0.590 (Refer Table 4) is considered satisfactory in exceeding the 0.5 threshold value, confirming the reliability of the model. The findings emphasize the decisive role in the increase in education on consumers' influence on the rapidly changing consumer goods (FMCG). There is a positive correlation between the level of higher

education and the increase of awareness, and stable purchase habits emphasize the effects of knowledge of environmentally friendly consumption. Gender differences observed to pay premium prices for green products indicate the need for individual marketing approaches. The study also showed that consumer trust and product transparency on the disclosure of the ingredients had a great impact on preparing for more expenses for stable objects. This conclusion includes a clear and regulated environmental certificate.

Conclusion

Education and gender have a great impact on the willingness to use consumer awareness and environmentally friendly consumer goods (FMCG). Age is not a decision factor, but the level of higher education is raised and the floor affects the probability of paying more for stable products. Factors such as hub shampoo, ingredients and production processes also serve as a consumer choice. This idea provides valuable results to companies, civil servants and activists -economic experts who want to encourage sustainable consumption practices. In order to aim for the lack of knowledge and create a sexual marketing approach, stakeholders can help to overcome the gap between consumers' perception and actual environmental responsibility procurement behaviour.

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