A Study on the Impact of Green Marketing on Consumer Buying Behaviour with Special Reference to Chennai City

An Empirical Investigation of Eco-Conscious Purchase Determinants, Income Stratification, and Awareness Dynamics

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***Abstract*—Environmental degradation and climate change have compelled businesses to integrate ecological sustainability into their core marketing strategies. This study examines the impact of green marketing practices on consumer buying behaviour among urban consumers in Chennai, Tamil Nadu. A structured questionnaire was administered to a sample of 110 respondents across North, Central, South, and West Chennai using convenience and purposive sampling techniques. Primary data were analyzed using percentage analysis, One-Way Analysis of Variance (ANOVA), Pearson Chi-Square test of independence, and Henry Garrett Ranking technique. The One-Way ANOVA reveals a statistically significant difference in green buying behaviour across monthly income groups ($F = 32.804$, $p < 0.001$), confirming that higher-income consumers exhibit stronger eco-friendly purchasing tendencies. The Chi-Square analysis establishes a significant association between consumer awareness of green marketing and frequency of green product purchases (Chi-Square = 19.632, $p = 0.0006$). Furthermore, Henry Garrett Ranking identifies environmental concern and sustainability (mean score = 57.39) as the foremost driver of green purchases, followed by eco-friendly packaging and health benefits. The findings offer actionable insights for marketers and policymakers to strengthen green brand credibility and affordability in metropolitan markets.**

***Index Terms*—Consumer Buying Behaviour, Eco-Friendly Packaging, Green Marketing, Henry Garrett Ranking, One-Way ANOVA, Sustainable Consumption, Chennai**

I. Introduction

Over the past two decades, rapid industrialization, plastic accumulation, and resource depletion have heightened global ecological consciousness. As consumers become increasingly aware of the environmental consequences of their consumption habits, organizations have transitioned from conventional profit-centric models to sustainable, triple-bottom-line frameworks. Green marketing, also referred to as environmental or ecological marketing, encompasses a holistic range of activities including sustainable product modification, changes in production processes, biodegradable packaging, and eco-conscious advertising. Unlike traditional marketing that prioritizes immediate functional utility and cost minimization, green marketing aligns commercial value creation with environmental stewardship.

In emerging economies like India, metropolitan hubs represent critical testing grounds for sustainable retail transitions. Chennai, one of India's largest commercial, industrial, and educational centers, has witnessed growing regulatory and civic emphasis on waste segregation, single-use plastic bans, and renewable energy adoption. Urban consumers in Chennai are increasingly exposed to eco-labels, organic food segments,

energy-efficient appliances, and cruelty-free personal care brands. However, a persistent gap—frequently termed the 'green attitude-behaviour gap'—often separates stated environmental concern from actual point-of-sale purchase execution due to price premiums, skepticism toward greenwashing, and limited retail availability. Investigating the empirical drivers and demographic moderators of green buying behaviour in Chennai is therefore vital for aligning corporate sustainability initiatives with real consumer demand.

II. Review of literature and research gap

Bharti, Agarwal and Satsangi (2024) examined the behavioral intention of Indian consumers towards green marketing, focusing on the mediating role of environmental attitude. The study collected responses from 134 Indian consumers and found that green marketing practices influence consumer attitudes and purchase intentions towards environmentally friendly products. **Megha (2024)** conducted a systematic literature review on the determinants of green consumption using the TCCM approach. The study highlighted that environmental awareness and positive attitudes encourage green consumption; however, there is still a gap between consumers' favorable attitudes and their actual purchasing behavior. **Meet, Kundu and Ahluwalia (2024)** investigated the influence of socio-demographic factors, greenwashing and green marketing mix on Generation Z consumers' purchase intention towards environmentally friendly packaged drinks in India. Based on 380 respondents, the study examined how marketing strategies and consumer characteristics shape green purchase intentions. **Pardeshi, Pardeshi and Khanna (2024)** studied the impact of environmental knowledge, past sustainable behaviour and social influence on sustainable apparel purchase intention in India. Using responses from 518 participants, the study found that environmental knowledge and previous sustainable practices significantly influence consumers' intention to purchase sustainable clothing.

Although green marketing has gained importance in influencing consumer preferences, there is limited understanding of its impact on actual buying behaviour among consumers in Chennai City. The influence of green advertising, eco-friendly packaging, environmental awareness and product quality on purchase decisions requires further study. Consumers may have positive attitudes towards environmentally friendly products, but these attitudes may not always translate into actual purchases. Therefore, this study aims to examine the impact of green marketing on consumer buying behaviour among 110 respondents in Chennai City.

III. Objectives and Hypothesis of the study

A. Primary Objectives

1) To examine the socio-demographic profile and green product awareness level of consumers in Chennai city.

2) To analyze whether there is a significant difference in green consumer buying behaviour across different monthly income groups using One-Way ANOVA.

3) To test the association between consumer awareness of green marketing initiatives and the frequency of purchasing green products using Chi-Square analysis.

4) To identify and rank the key green marketing factors influencing consumer buying decisions using the Henry Garrett Ranking technique.

B. Formulated Hypothesis

H01 (Null Hypothesis 1): There is no statistically significant difference in green consumer buying behaviour scores across different monthly income groups of respondents in Chennai.

H02 (Null Hypothesis 2): There is no statistically significant association between the level of green marketing awareness and the frequency of green product purchase among respondents.

IV. Research Methodology

The present study adopts a descriptive and analytical research design based on primary data collected from retail consumers residing in Chennai city. To ensure comprehensive geographic representation across the metropolitan area, respondents were drawn from four major zones: South Chennai, West Chennai, Central Chennai, and North Chennai. A non-probability purposive and convenience sampling method was employed to select 110 respondents who actively participate in household and personal retail purchasing decisions.

Primary data were gathered through a structured, pre-tested questionnaire. Secondary data were sourced from peer-reviewed journals, sustainability reports, and marketing publications. Statistical processing was carried out using SPSS and Python statistical libraries, applying Percentage Analysis, One-Way ANOVA, Pearson Chi-Square Test, and Henry Garrett Ranking.

V. Data Analysis and Interpretation

A. Demographic Profile of Respondents (N = 110)

Table 1 presents the socio-demographic distribution of the 110 respondents surveyed across Chennai. Male respondents constitute 51.82% (57) and female respondents account for 48.18% (53), reflecting balanced gender participation. A majority of the sample falls within the economically active age brackets of 26–35 years (36.36%) and 18–25 years (32.73%). Educationally, 44.55% hold postgraduate qualifications and 30.91% are undergraduates, indicating a well-educated urban respondent base. Geographically, South Chennai represents 30.91% of respondents, followed by West Chennai (28.18%), Central Chennai (22.73%), and North Chennai (18.18%).

Table 1: Socio-Demographic Profile of Respondents in Chennai (N = 110)

Demographic Variable	Category	No. of Respondents	Percentage (%)
Gender	Male	57	51.82
	Female	53	48.18
Age Group	18–25 Years	36	32.73
	26–35 Years	40	36.36
	36–45 Years	19	17.27
	Above 45 Years	15	13.64
Educational Qualification	Higher Secondary / Diploma	11	10.00
	Undergraduate	34	30.91
	Postgraduate	49	44.55
	Professional / Doctorate	16	14.55
Monthly Family Income	Below ₹25,000	30	27.27
	₹25,001 – ₹50,000	32	29.09
	₹50,001 – ₹75,000	31	28.18

	Above ₹75,000	17	15.45
Residential Zone (Chennai)	North Chennai	20	18.18
	Central Chennai	25	22.73
	South Chennai	34	30.91
	West Chennai	31	28.18
Total	**All Categories**	**110**	**100.00**

Source: Primary data

B. One-Way ANOVA: Monthly Income vs. Green Consumer Buying Behaviour

A One-Way Analysis of Variance (ANOVA) was conducted to evaluate whether green consumer buying behaviour scores (measured on a 5-point composite Likert scale) differ significantly across the four monthly income brackets in Chennai. Table 2 summarizes the group descriptive statistics and ANOVA test output.

Table 2: Group Descriptives and One-Way ANOVA Results across Monthly Income

Monthly Income Group	N	Mean Score	Std. Deviation	Std. Error
Below ₹25,000	30	2.908	0.560	0.102
₹25,001 – ₹50,000	32	3.644	0.590	0.104
₹50,001 – ₹75,000	31	4.064	0.520	0.093
Above ₹75,000	17	4.376	0.564	0.137
Total / Overall	**110**	**3.671**	**0.765**	**0.073**

Source: Calculated data

Table 3: ANOVA Summary Table for Green Buying Behaviour by Income

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-Ratio	p-Value (Sig.)
Between Groups	30.739	3	10.246	32.804	0.000*
Within Groups	33.109	106	0.312	—	—
Total	**63.848**	**109**	—	—	—

Source: Calculated data

Interpretation (ANOVA): As shown in Table 2 and Table 3, the calculated F-value is 32.804 with degrees of freedom (3, 106) and a p-value of 0.000 ($p < 0.01$). Since the p-value is well below the 0.05 significance threshold, the null hypothesis (H01) is rejected. Mean buying behaviour scores rise steadily from 2.908 for respondents earning below ₹25,000 to 4.376 for those earning above ₹75,000, demonstrating that higher disposable income significantly enhances consumers' capacity and willingness to purchase eco-friendly products in Chennai.

C. Chi-Square Test: Green Marketing Awareness vs. Purchase Frequency

To test the second hypothesis (H02), a cross-tabulation and Pearson Chi-Square test of independence were performed between respondents' awareness of green marketing initiatives and their purchase frequency of green products.

Table 4: Cross-Tabulation of Green Awareness and Purchase Frequency (N = 110)

Green Marketing Awareness	Frequently	Occasionally	Rarely	Row Total
Yes, Fully Aware	42 (58.33%)	25 (34.72%)	5 (6.94%)	72 (100.0%)
Partially Aware	9 (27.27%)	18 (54.55%)	6 (18.18%)	33 (100.0%)
Not Aware	1 (20.00%)	1 (20.00%)	3 (60.00%)	5 (100.0%)
Column Total	**52 (47.27%)**	**44 (40.00%)**	**14 (12.73%)**	**110 (100.0%)**

Source: Calculated data

Table 5: Pearson Chi-Square Test Statistics

Statistical Test	Calculated Value	Degrees of Freedom (df)	Asymptotic Sig. (p-Value)	Result
Pearson Chi-Square	**19.632**	**4**	**0.00059***	**Significant (H02 Rejected)**

Source: Calculated data

Interpretation (Chi-Square): Table 4 reveals that among respondents who are fully aware of green marketing (72 respondents), 58.33% purchase green products frequently, whereas among unaware respondents, 60.00% purchase them rarely. From Table 5, the Pearson Chi-Square statistic is 19.632 (df = 4, p = 0.00059 < 0.01). Consequently, the null hypothesis (H02) is rejected, confirming a statistically significant association between green marketing awareness and actual green purchasing frequency.

D. Henry Garrett Ranking of Factors Influencing Green Buying Behaviour

Respondents ranked six core green marketing attributes from Rank 1 (most influential) to Rank 6 (least influential). Using Henry Garrett's conversion formula, Percent Position = 100 * (Rij - 0.5) / Nj, where Rij is the rank given by the ith respondent and Nj = 6 is the total number of ranked factors, the corresponding Garrett table values are: Rank 1 = 77, Rank 2 = 63, Rank 3 = 54, Rank 4 = 46, Rank 5 = 37, and Rank 6 = 23.

Table 6: Henry Garrett Ranking of Green Marketing Factors (N = 110)

Green Marketing Factor	R1 (77)	R2 (63)	R3 (54)	R4 (46)	R5 (37)	R6 (23)	Total Score	Mean Score	Rank
Environmental Concern & Sustainability	25	28	27	14	11	5	6313	57.39	I
Eco-Friendly Packaging & Biodegradability	26	22	17	32	8	5	6189	56.26	II
Health & Safety Benefits	20	25	22	18	18	7	5958	54.16	III
Eco-Labels & Green Certifications	20	11	20	19	18	22	5359	48.72	IV
Green Brand Reputation & Advertising	9	13	11	20	31	26	4771	43.37	V
Price Affordability & Value for Money	**10**	**11**	**13**	**7**	**24**	**45**	**4410**	**40.09**	**VI**

Source: Calculated data

Interpretation (Ranking Analysis): Table 6 demonstrates that 'Environmental Concern & Sustainability' secures Rank I with the highest Garrett mean score of 57.39 (total score = 6,313), closely followed by 'Eco-Friendly Packaging & Biodegradability' at Rank II (mean score = 56.26). 'Health & Safety Benefits' occupies Rank III (mean score = 54.16), while 'Eco-Labels & Green Certifications' ranks IV (mean score = 48.72). 'Green Brand Reputation & Advertising' (43.37) and 'Price Affordability & Value for Money' (40.09) occupy Ranks V and VI respectively, indicating that intrinsic ecological and health values outweigh promotional claims when Chennai consumers evaluate green products.

VI. Major Findings and Recommendations

1) Demographic Dominance: Young and middle-aged educated professionals (ages 18–35 accounting for 69.09%, and graduates/postgraduates accounting for 75.46%) form the core adopter segment for green products in Chennai.

2) Income Sensitivity (ANOVA): Green buying behaviour varies significantly across income tiers ($F = 32.804$, $p < 0.001$). Consumers earning above ₹50,000 exhibit substantially higher adoption scores (above 4.06) than lower-income groups (2.908), highlighting price premiums as a barrier for budget-conscious households.

3) Awareness-Purchase Linkage (Chi-Square): Awareness significantly drives purchase regularity (Chi-Square = 19.632, $p = 0.00059$). Over 58% of fully aware respondents buy green products frequently, compared to only 20% of unaware respondents.

4) Key Purchase Motivators (Garrett Ranking): Intrinsic ecological protection (57.39), biodegradable packaging (56.26), and personal health benefits (54.16) are the top three factors motivating Chennai consumers.

Recommendations: Organizations targeting Chennai's retail market should adopt tiered pricing or refill-pack models to make green products accessible to middle- and lower-income consumers. Marketers must prioritize verifiable third-party eco-certifications and plastic-free packaging over generic green advertising, while partnering with local retail chains and educational institutions to run experiential awareness campaigns.

VII. Conclusion

This empirical investigation of 110 consumers in Chennai confirms that green marketing significantly shapes modern consumer buying behaviour, mediated by consumer awareness and economic capacity. While ecological concern, sustainable packaging, and health safety serve as primary purchase catalysts, bridging the affordability gap for lower-income segments remains essential for mass-market adoption. Companies that embed authentic environmental accountability into product design, packaging, and transparent labeling will achieve durable competitive advantage and foster sustainable urban consumption in Chennai.

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