



## A STUDY ON THE IMPACT OF SUSTAINABLE TRANSPORTATION INITIATIVES ON RETAIL STORE IMAGE AND CONSUMER PERCEPTION IN TRICHY

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### Abstract:

The primary objective of this study is to examine the impact of sustainable transportation initiatives on retail store image and consumer perception. The study focuses on understanding how eco-friendly transportation practices adopted by retail stores influence consumer awareness, trust, perception, and overall evaluation of the brand. A descriptive research design was employed for the study, and data were collected through a structured questionnaire using a survey-based method. A pilot study was conducted with 30 respondents, and the reliability analysis yielded a Cronbach's Alpha value of 0.752, indicating acceptable reliability. The final sample size consisted of 226 respondents. Both primary and secondary data were utilized for analysis. The collected data were analysed using percentage analysis, correlation, and multiple regression techniques. The findings reveal that sustainable transportation initiatives have a significant positive impact on retail store image and consumer perception. The study concludes that adopting eco-friendly transportation practices enhances brand value and positively influences consumer attitudes. It also suggests that increasing awareness and improving sustainable logistics strategies can further strengthen store image and customer perception.

**Keywords:** Sustainable transportation, Retail store image, Consumer perception, Eco-friendly Logistics, Brand Value Enhancement

## 1. INTRODUCTION

Sustainability measures in transportation have gained importance in retailing businesses because of environmental issues. Eco-friendly practices such as green logistics, green vehicles, and low carbon emissions have been adopted by retailers to demonstrate environmental conservation efforts. In addition to environmental protection, eco-friendly activities enhance brand reputation. The reputation of a company that practices social responsibility and eco-friendliness is likely to be favorable. Consumer perceptions are key determinants of purchasing behavior and brand loyalty. It is important to understand the effect of sustainable transportation strategies on brand reputation and consumer perceptions.

## OBJECTIVES

1. To study consumer awareness about sustainable transportation initiatives followed by retail stores.
2. To analyze the impact of sustainable transportation initiatives on retail store image.
3. To examine consumer perception towards retail stores adopting sustainable transportation practices.
4. To identify the relationship between sustainable transportation initiatives and consumer perception.

## **2.REVIEW OF LITERATURE**

**Ahmed et al. (2019)** conducted a comprehensive study on green transportation practices such as the use of eco-friendly vehicles, optimized routing systems, and energy-efficient logistics operations. Their research emphasized that sustainability initiatives significantly enhance customer satisfaction, especially when service reliability is maintained. The study revealed that customers appreciate environmentally friendly practices only when they do not compromise convenience and timeliness. Furthermore, the authors concluded that integrating sustainability with high service quality plays a crucial role in encouraging long-term adoption of green transportation and building strong customer loyalty.

**Bergsten (2021)** developed a performance measurement framework aimed at supporting decision-making in green transportation systems. The study focused on systematically measuring greenhouse gas emissions within industrial transport chains. It identified key stakeholders and processes involved in data collection, standardization, and analysis. The research highlighted the importance of collaboration and technological support in ensuring accurate emission measurement. The findings suggested that effective performance frameworks help organizations align transportation practices with environmental sustainability goals and improve long-term management strategies.

**Liang and Zhao (2022)** analyzed customer satisfaction in public transportation systems using online review data. Their findings showed that factors such as punctuality, cleanliness, safety, and environmental initiatives play a significant role in shaping customer perceptions. Customers responded positively to sustainable transport practices, especially when combined with high-quality service. The study concluded that integrating sustainability with service excellence leads to improved satisfaction levels in public transportation.

**Reddy and Singh (2021)** investigated sustainable transport solutions such as electric vehicles and improved cycle rickshaws in the Indian context. The findings showed that eco-friendly transportation improves commuter satisfaction when it is affordable and reliable. The study highlighted reduced pollution levels and enhanced user experience as key benefits. It concluded that adopting green transportation systems contributes to sustainable urban mobility.

**Verma and Sharma (2022)** examined young consumers' perceptions of green mobility solutions in emerging economies. The study found that environmental awareness strongly influences both satisfaction and adoption. Generation Z showed a preference for green transportation when it is accessible and affordable. The research concluded that aligning sustainability with consumer expectations enhances behavioral intention toward eco-friendly transport.

## **3.RESEARCH METHODOLOGY**

### **3.1.1 Research design**

Descriptive research design is use for conduct of the study.

### **3.2 Questionnaire Design**

The data was collected through a structured questionnaire, which was prepared based on the objectives and the variables that affects the study. The structured questionnaire consists of various types of questions like closed end questions and 5-point Likert scale has been used.

### **3.3 Pilot Study**

Pilot study was conducted with 32 respondents.

#### **3.3.1 Reliability statistics**

The reliability of the questionnaire was done using Cronbach's Alpha test (0.752), and

#### **3.3.2 Validity statistics**

The validity of the questionnaire was tested through CFA (Confirmatory Factor Analysis).

**Refer the output in ANNEXURE 3**

### **3.4 Sampling framework**

Sample size – The sample size is 226 respondents selected from customers in Tiruchirappalli (Trichy) who shop at retail stores and are aware of or have experienced green transportation initiatives such as eco-friendly delivery systems. The respondents were chosen to collect relevant data regarding consumer perception, satisfaction, and their views on the impact of green transportation initiatives on retail store image.

#### **3.4.1 Sample Technique**

The study adopted non-probability sampling techniques such as convenience sampling and purposive sampling.

##### **Convenience sampling**

Convenience sampling is a method of selecting samples based on ease and availability.

That means the researcher collects data from people who are easy to reach.

##### **Purposive sampling**

Purposive sampling is a method where the researcher selects specific people intentionally based on the purpose of the study.

### **3.5 Source of data collection**

The data was collected from both primary and secondary source

#### a) Primary data

Structured questionnaire (closed-ended and Likert scale questions).

#### b) Secondary Data

Secondary data is collected from Journals, Websites, Research articles, Government reports.

### 3.6 Statistical tools used for the study:

The data collected were analysed and interpreted using statistical tools such as simple percentage analysis, Correlation analysis, Multiple regression analysis.

#### 3.6.1 Simple percentage method

Percentage analysis method is to represent raw streams of data as a percentage (a part in 100%) for better understanding of collected data.

$$\text{(\% = } \frac{\text{(No. of respondents)}}{\text{(total sample size)}} \times 100) \quad \text{—————}$$

#### 3.6.2 Correlation Analysis

Correlation method in research methodology is a statistical technique used to determine the degree and direction of a relationship between two or more variables. It helps researchers understand whether and how strongly pairs of variables are related.

#### 3.6.3 Multiple Regression Analysis

Multiple Regression is a statistical method used to analyze the relationship between a dependent variable and independent variables. It extends the concept of simple linear regression, which examines the relationship between a dependent variable and an independent variable.

## 4. DATA ANALYSIS AND INTERPRETATION

### 4.1 Percentage Analysis

**Table 1.1: Demographic Profile**

Particulars		No. of Respondents	Percentage (%)
Respondents Age	Below 20	24	11
	21-30	87	38
	31-40	74	33
	41-50	32	14
	Above 50	9	4
Gender	Male	123	54
	Female	99	44

	Others	4	2
Educational Qualification	Up to 12 <sup>th</sup> Standard	24	11
	UG	112	50
	PG	59	26
	Others	31	14
Income level	Less than 10,000	37	16
	10,000-25000	68	30
	25,001-50,000	78	34
	50,001-1,00,000	35	15
	More than 1,00,000	8	3
Occupation	Private sector	104	46
	Government sector	38	17
	Business	53	23
	Homemaker	9	4
	Others	22	10
Area of residence	Urban	46	20
	Semi-urban	163	72
	Rural	17	7
1.Where do you shop frequently	Department store	29	13
	Supermarket	126	56
	Shopping mall	28	12
	Convenience store	24	11
	Kirana/Petty	12	5
	Others	7	3
2.Mention the reason for preference of the shop you purchase frequently	Product category	32	14
	Nearness	45	20
	Cost saving	54	24
	Eco-Friendly products	41	18

Availability	26	11
Store Image/Name	24	11
Others	4	2

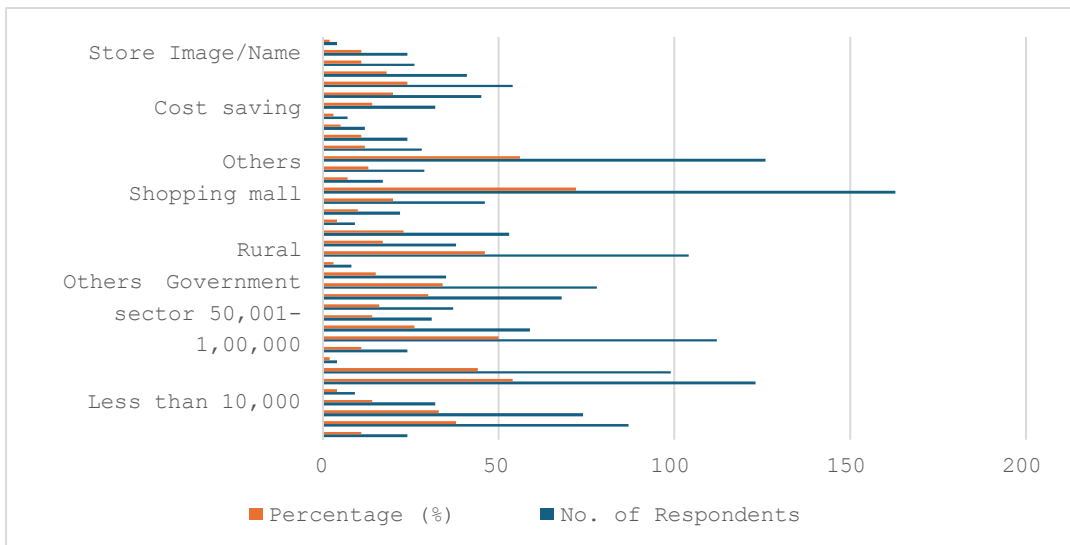


Fig 1.1

### Interpretation

The table shows the demographic profile and shopping behaviour of respondents. A majority of respondents belong to the 21–30 age group, followed by 31–40 years, indicating that young and middle-aged individuals are more active. In terms of gender, male respondents are comparatively higher than female respondents. Most respondents are graduates, followed by postgraduates, showing a good educational background. Regarding income level, a large number of respondents fall under the ₹25,001–50,000 category, followed by ₹10,000–25,000. In occupation, most respondents are working in the private sector, followed by business and government sector. A majority of respondents reside in semi-urban areas. In terms of shopping preference, supermarkets have the highest preference, followed by department stores and shopping malls. The main reasons for preferring a shop include cost saving, nearness, and eco- friendly products.

### Inference

The study reveals that the respondents are mainly young, educated individuals with moderate income levels, mostly working in the private sector and residing in semi-urban areas. Supermarkets are the most preferred shopping place

due to affordability and convenience, and purchasing decisions are largely influenced by cost-saving and proximity factors.

**Table no 1.2: sustainable transportation**

Particulars	NO OF RESPONDENTS (%)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3. Are you aware of green transportation initiatives followed by retail stores in Trichy	35	43	16	4	0.9
4. Does the retail stores use electric vehicles for delivery of the product where you purchase	33	38	21	7	0.9

6. Do you noticed green transport delivery services used by retail stores	25	30	35	8	1
7. Does there is a use of green packaging in retail stores.	24	28	31	12	4



Fig 1.2

### Interpretation

The table shows the awareness and perception of respondents towards green transportation initiatives followed by retail stores in Trichy. A majority of respondents are aware of green transportation initiatives, with 35% strongly agreeing and 43% agreeing, indicating good awareness among customers. Regarding the use of electric vehicles for delivery, most respondents responded positively, with 33% strongly agreeing and 38% agreeing, showing that such practices are being adopted by retail stores.

In terms of awareness about environmental benefits, a large number of respondents (44%) remain neutral, followed by 30% agreeing, indicating moderate awareness. Similarly, when asked about noticing green transport delivery services, 35% of respondents are neutral, while 30% agree and 25% strongly agree, suggesting that these services are not clearly visible to all customers. Regarding green packaging, most respondents show a balanced opinion, with 31% neutral and a considerable number agreeing, indicating gradual adoption by retail stores.

### Inference

The study reveals that respondents have a general awareness of green transportation initiatives and the use of electric vehicles in retail stores. However, their understanding of environmental benefits and visibility of such practices is moderate. The presence of a high number of neutral responses indicates that many respondents are not fully aware or have not clearly noticed these initiatives.

Therefore, it can be inferred that while retail stores are implementing green practices, there is a need to improve awareness and visibility among consumers to enhance their perception and satisfaction.

**Table 1.3: Retail store image**

Particulars	NO OF RESPONDENTS (%)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
8. Does the Retail stores use green transportation improves positive store image	38	24	26	7	4
9. Does green transportation delivery improve the reputation of retail stores	18	42	27	8	4
10. Does Green transportation initiatives adopted by retail store look socially responsible	29	28	33	7	3
11. Does retail Stores using green initiatives transport appear more trustworthy to buy the product in the stores	25	32	24	14	5

12. Do the Green transportation initiatives differentiate store from its competitors retail stores	30	30	26	9	5
13. Do you prefer store that follow green transportation practices.	24	27	36	7	4

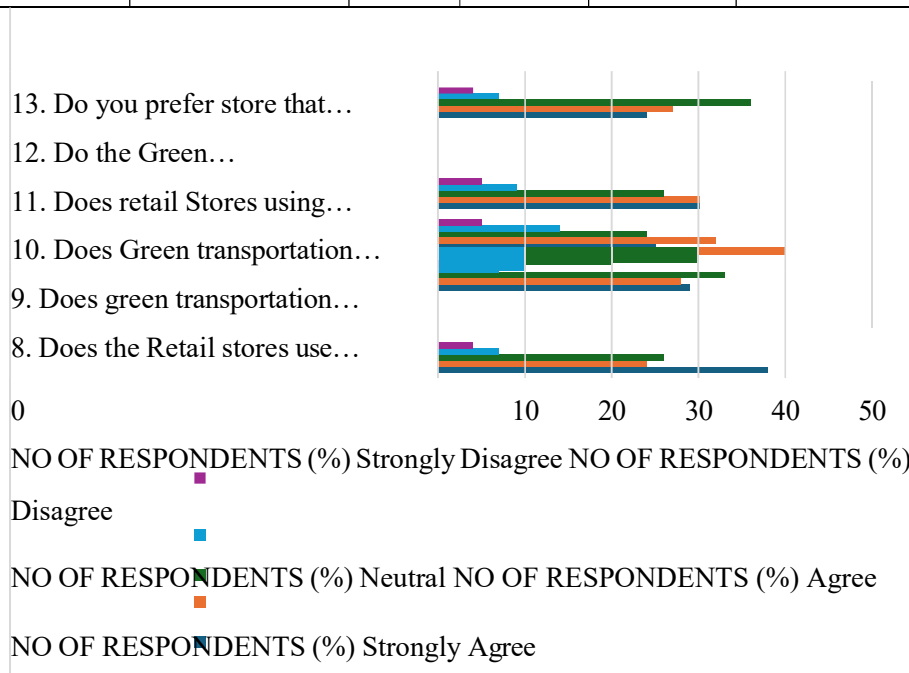


Fig:1.3

### Interpretation

The table shows the impact of green transportation initiatives on retail store image and customer perception. A majority of respondents believe that green transportation improves the store image, with 38% strongly agreeing and 24% agreeing, indicating a positive perception. Similarly, regarding the reputation of retail stores, most respondents agree (42%) and strongly agree (18%) that green delivery enhances the store's reputation.

In terms of social responsibility, 33% of respondents remain neutral, while a significant number agree that such initiatives reflect socially responsible behavior. When it comes to trust, 32% agree and 25% strongly agree that stores using green transportation appear more trustworthy, although some respondents (14%) disagree.

Regarding differentiation, most respondents agree (30%) and strongly agree (30%) that green initiatives help retail stores stand out from competitors. However, in terms of preference, a large number of respondents (36%) remain neutral, while 27% agree and 24% strongly agree, indicating that preference towards such stores is moderate.

### **Inference**

The study reveals that green transportation initiatives positively influence retail store image, reputation, trust, and differentiation. Most respondents perceive such stores as socially responsible and trustworthy.

However, the presence of a high number of neutral responses, especially in social responsibility and preference, indicates that customers are not fully convinced or influenced in their buying decisions. Therefore, retail stores need to improve awareness and communication of their green initiatives to strengthen customer preference and competitive advantage.

**Table 1.4: Consumer Satisfaction**

Particulars	NO OF RESPONDENTS (%)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
14. Knowing that order was delivered using green transportation	35	24	29	10	2

reduces by “buyer guilt”

15. Does the Green transportation initiatives

improve overall shopping experience in the retail stores	24				
16. Does the green transportation initiatives enhance timely delivery improves consumer satisfaction	30	34	30	7	4
		27	27	13	2
17. Overall, do you feel more satisfied with retail store because of their green transportation efforts	29	33	26	10	2

Strongly Disagree

Disagree Neutral Agree

Strongly Agree

0 5 10 15 20 25 30 35 40

17. Overall, do you feel more satisfied with retail store because of their green transportation efforts

16. Does the green transportation initiatives enhance timely delivery improves consumer satisfaction

15. Does the Green transportation initiatives improve overall shopping experience in the retail stores

14. Knowing that order was delivered using green transportation reduces by “buyer guilt”

Fig:1.4

**Interpretation**

The table shows the impact of green transportation initiatives on consumer satisfaction and shopping experience. A majority of respondents agree that knowing their order was delivered using green transportation reduces buyer guilt, with 35% strongly agreeing and 24% agreeing, indicating a positive emotional response.

Regarding the overall shopping experience, most respondents show a positive opinion, with 34% agreeing and 24% strongly agreeing, while 30% remain neutral, suggesting moderate improvement. In terms of timely delivery and satisfaction, responses are fairly distributed, with 30% strongly agreeing and 27% agreeing, while an equal percentage (27%) remain neutral, indicating that while green initiatives contribute to satisfaction, the impact is not very strong for all respondents.

Overall satisfaction with retail stores due to green transportation efforts is also positive, with 33% agreeing and 29% strongly agreeing, though 26% of respondents remain neutral, showing that not all customers are fully influenced.

**Inference**

The study reveals that green transportation initiatives have a positive impact on consumer satisfaction, shopping experience, and emotional factors such as reducing buyer guilt. Most respondents feel satisfied and perceive improvements in their shopping experience.

However, the presence of a considerable number of neutral responses indicates that the influence of green initiatives is moderate and not strong enough to affect all consumers equally. Therefore, retail stores should enhance awareness and effectively communicate their green practices to strengthen customer satisfaction and loyalty.

**Table 1.5: Behavioural Intention**

Particulars	NO OF RESPODENTS (%)				
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
18. Do you recommend the retail stores to others because of their green	35	37	19	9	0

transportation initiatives					
19. Do you continue to shop at the retail stores, especially because of their commitment to green transportation initiatives	27	37	28	7	0.4
20. Do you wait an extra day for delivery, if it means the transportation method is "greener"	77	50.8	24.1	5.3	1

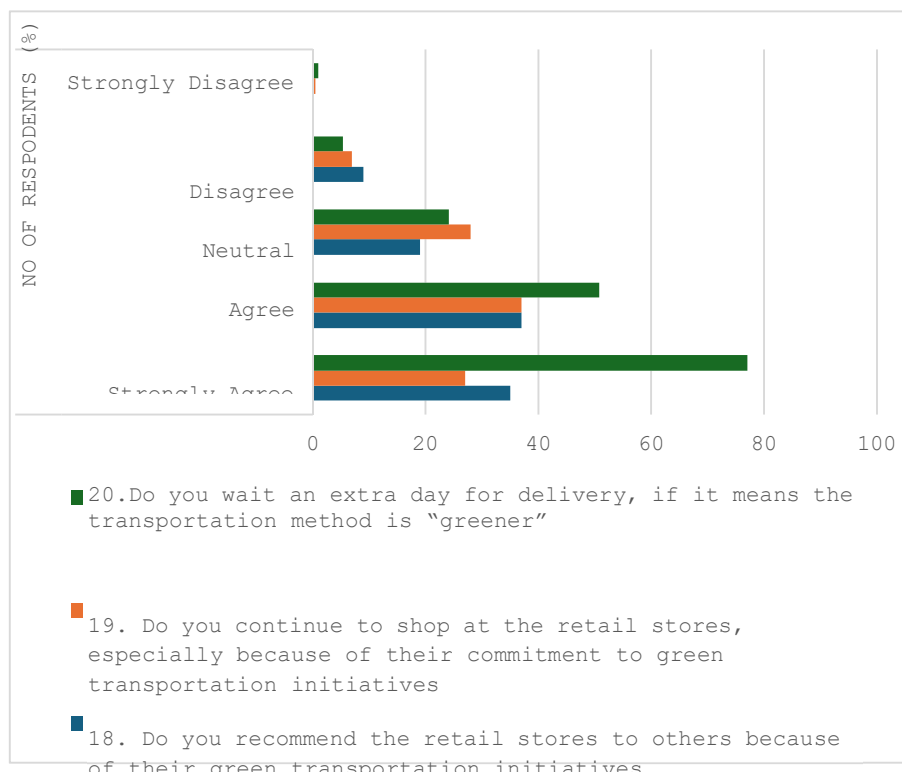


Fig:1.5

## **Interpretation**

The table shows the impact of green transportation initiatives on customer loyalty and behavioural intention. A majority of respondents are willing to recommend retail stores to others because of their green transportation practices, with 35% strongly agreeing and 37% agreeing, indicating strong positive word-of-mouth. Similarly, most respondents show willingness to continue shopping at retail stores due to their commitment to green transportation, with 27% strongly agreeing and 37% agreeing, while 28% remain neutral, suggesting moderate loyalty among some customers. Regarding willingness to wait for greener delivery methods, a high number of respondents (77%) strongly agree and 50.8% agree, indicating a strong preference for environmentally friendly delivery options, even if it requires extra time. Only a small percentage of respondents disagree, showing overall positive acceptance.

## **Inference**

The study reveals that green transportation initiatives have a strong influence on customer loyalty, recommendation, and behavioral intention. Most respondents are willing to recommend and continue shopping with retail stores that follow eco-friendly practices. Additionally, customers show a high level of willingness to accept delays for greener delivery methods, indicating growing environmental concern and support for sustainability. Therefore, it can be inferred that green transportation initiatives play a significant role in building customer loyalty and long-term relationship with retail stores.

## 4.2 CORRELATION ANALYSIS

### Null Hypothesis (H<sub>0</sub>):

There is no significant relationship between sustainable transportation initiatives and retail store image.

### Alternative Hypothesis (H<sub>1</sub>):

There is a significant relationship between sustainable green transportation initiatives and retail store image.

		Green Initiatives	Store Image
Sustainable Initiatives	Pearson Correlation	1	.331**
	Sig. (2-tailed)		.000
	N	226	226
Store Image	Pearson Correlation	.331**	1
	Sig. (2-tailed)	.000	
	N	226	226

Correlation is significant at the 0.01 level (2-tailed).

### Interpretation:

The results of the Pearson Correlation analysis show that there is a positive relationship between sustainable transportation initiatives and retail store image. The correlation coefficient (r) is 0.331, which indicates a positive relationship between the two variables. The significance value (p-value) is 0.000, which is less than 0.01, showing that the relationship is statistically significant. This means that as customers' perception of green transportation initiatives increases, the retail store image also improves.

### Inference:

Therefore, the null hypothesis is rejected, and it is concluded that there is a significant positive relationship between sustainable transportation initiatives and retail store image.

## 4.3 MULTIPLE REGRESSION ANALYSIS

**Null Hypothesis (H<sub>0</sub>):** sustainable Transportation Initiatives and Retail Store Image do not have a significant effect on Consumer perception in Trichy.

**Alternative Hypothesis (H<sub>1</sub>):** sustainable Transportation Initiatives and Retail Store Image have a significant effect on Consumer perception in Trichy.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.506 <sup>a</sup>	.256	.249	1.87167

a. Predictors: (Constant), Store Image, sustainable Initiatives

**ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	268.189	2	134.095	38.278	.000 <sup>b</sup>
	Residual	781.201	223	3.503		
	Total	1049.390	225			

a. Dependent Variable: c\_s

b. Predictors: (Constant), Store Image, sustainable Initiatives

**Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	3.572	1.020		3.503	.001
	sustainable Initiatives	.229	.059	.238	3.894	.000
	Store Image	.254	.042	.374	6.104	.000

a. Dependent Variable: c\_s

**Interpretation:**

The multiple regression analysis shows that there is a significant relationship between sustainable transportation initiatives, retail store image, and consumer perception. The model has an R value of 0.506, indicating a moderate relationship, and the R<sup>2</sup> value of 0.256 shows that 25.6% of the variation in consumer perception is explained by the independent variables. The ANOVA result (p = 0.000) indicates that the overall model is statistically significant. The coefficients reveal that both green transportation initiatives ( $\beta = 0.238$ , p = 0.000) and store image ( $\beta = 0.374$ , p = 0.000) have a positive and significant effect on consumer satisfaction. This means that sustainable initiatives and store image increase, consumer satisfaction also increases.

**Inference:**

Therefore, it is concluded that both variables have a significant positive impact on consumer perception.

**5. FINDINGS**

Generally, the research indicates that most respondents are young, medium-income, semi-urban consumers who frequently use the supermarket as their primary purchasing site. Although quite a number of the participants have knowledge about green transportation measures implemented in retail stores, majority of them are neutral regarding their awareness or perception of such measures. According to the results, green transportation moderately improves the image and reputation of retail stores. Furthermore, green transportation positively impacts customer satisfaction and reduces consumer buyer’s guilt. Nonetheless, consumer preferences are developing, considering most consumers are willing to embrace green practices. The calculated p-value is lesser than 0.01. Therefore, the null hypothesis is rejected, and it is concluded that there is a significant positive relationship between sustainable green transportation initiatives and retail store image. The calculated p-value is lesser than 0.05. Therefore, it is concluded that both variables sustainable transportation initiatives and store image have a significant positive impact on consumer perception.

**SUGGESTIONS**

Retailers should promote sustainable initiatives through digital media, advertisements, and in-store communication to improve consumer perception. Clear information about environmental benefits and visible eco-friendly practices can help build customer trust. Targeted marketing strategies and incentives can encourage consumers to choose sustainable options. Efficient operations, flexible delivery choices, and consistent implementation of sustainable practices can further enhance consumer perception. Regular training for employees and continuous improvement in sustainability efforts can help maintain competitiveness and long-term customer engagement.

## **6.CONCLUSION**

The study concludes that sustainable initiatives have a positive impact on store image and consumer perception. Although many respondents are aware of eco-friendly practices, there is still a need to improve awareness among customers. These initiatives enhance trust, reputation, and overall shopping experience. The statistical analysis indicates a significant relationship between sustainable initiatives and consumer behaviour, and also confirms a positive influence on consumer perception. Customers are willing to support eco-friendly delivery methods, even if it takes more time, contributing to both sustainability and business growth.

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