

A Study on Customer Perception on Environmental Sustainability Initiatives Adopted by Indian Railways

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Abstract: This study focuses on analysing the customer perception on environmental sustainability initiatives adopted by Indian Railways. Indian Railways has introduced several sustainability initiatives such as bio-toilets, paperless e-tickets, tree plantation, solar energy usage and waste management to reduce environmental impact and promote eco-friendly transportation. The main objective of the study is to understand the awareness level, preference and problems faced by passengers regarding these initiatives. Primary data were collected from 100 respondents using a structured questionnaire, while secondary data were collected from journals, books and websites. Percentage analysis, Chi-square test, Likert scale and Rank analysis were used to analyse the collected data. The study helps to understand the level of awareness among passengers about sustainability initiatives and their perception towards these eco-friendly practices adopted by Indian Railways. The findings also provide suggestions for improving environmental sustainability initiatives and increasing passenger awareness.

Keywords: Customer Perception, Environmental Sustainability, Indian Railways, Awareness, Green Initiatives.

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I. INTRODUCTION

In Indian Railways, one of the largest railway networks in the world, sustainability has emerged as a key focus area. Every day, millions of passengers depend on railway services for affordable and convenient travel. Recognizing this responsibility, Indian Railways has adopted several environmental sustainability initiatives aimed at reducing carbon emissions, conserving energy, managing waste effectively, and promoting the use of renewable resources. Some of the major sustainability initiatives include electrification of railway tracks, installation of solar panels at railway stations, use of bio-toilets in coaches, rainwater harvesting systems, waste management programs, plastic reduction campaigns, and energy-efficient LED lighting across stations and trains.

➤ Statement of the Problem

Indian Railways has adopted several environmental sustainability initiatives such as electrification, solar energy usage, bio-toilets, and waste management systems. These initiatives aim to reduce environmental impact and promote eco-friendly transportation. However, the effectiveness of these initiatives depends largely on passenger awareness and perception. It is not clearly known whether customers are

fully aware of these sustainability measures. It is also uncertain whether such initiatives influence passengers' preference for choosing railway services. Moreover, customers may face certain problems related to the implementation of these initiatives. Therefore, there is a need to study customers' perception, awareness level, preference, and the challenges they experience regarding environmental sustainability initiatives adopted by Indian Railways.

➤ Objective of the Study

- To study the environmental sustainability initiatives adopted by Indian Railways and to assess the level of awareness among passenger regarding these initiatives.
- To find out whether environmental initiatives influence passenger's preference for Indian Railways
- To identify the problems faced by customer regarding sustainability initiatives.
- To offer suggestions for improving customer awareness and perception of sustainability initiatives.

➤ Scope of the Study

This study focuses on analysing customers perception of environmental sustainability initiatives adopted by Indian Railways. It examines the level of awareness among

passengers regarding various eco-friendly measures implemented in railway services. The study also evaluates how these initiatives influence passenger preference and satisfaction.

II. RESEARCH METHODOLOGY

➤ Primary Data:

Primary data refers to first-hand information collected directly from respondents for the specific purpose of the study. In this research, primary data was collected through a structured questionnaire administered to railway passengers.

➤ Secondary Data

Secondary data refers to information that has already been collected and published by other sources. For this study, secondary data was collected from academic journals, research articles and relevant websites.

➤ Sample Size

The total sample size for the study consists of 100 respondents. The sample size was considered adequate to perform statistical analysis and draw meaningful conclusions regarding customer satisfaction levels.

➤ Tools for Analysis

- *Percentage Analysis*

Percentage analysis is used to analyze the responses of the respondents and present the result in a simple and understandable manner.

- *Chi-Square Analysis*

Chi-square test is used to find out the relationship between two variables.

- *Formular*

$$\chi^2 = \frac{\sum (O-E)^2}{E}$$

Where:

$$\text{Degree of freedom} = (r-1)(c-1)$$

(O= Observed value; E= Expected value)

III. REVIEW AND LITERATURE

➤ Rishikesh Kumar (2025)¹

In their study “sustainability in Indian railways” presented an overview of sustainability initiatives undertaken by the organization. To examine the environmental, social, and economic dimensions of sustainability within Indian Railways, focusing on how the organisation balances ecological impact, social responsibility, and economic performance. The report followed a descriptive reporting methodology based entirely on secondary data collected internally. Tools used are performance indicator and emission metric.

➤ Aparajita Rai (2025)²

In this research, “Riding the green rails: Revolutionising Indian Railways with Renewable energy” to assess the contribution of renewable energy adoption towards achieving net-zero carbon emissions goals set by Indian Railways by 2030 and explore mechanisms for energy efficient rolling stock operations. they use energy demand forecasting tool to research and gap analysis methodology. The study explores holistic sustainability efforts, including installation of bio-toilets, water recycling system.

IV. ANALYSIS OF DATA

➤ Percentage Analysis

How Respondents Came to Know About the Environmental Sustainability Initiatives of Indian Railways.

Table 1 Percentage Analysis

Source of awareness	No of respondents	Percentage
Social media	43	43%
At railway station	29	29%
During train travel	21	21%
Through media/news	7	7%
Total	100	100%

➤ Interpretation

From the above table, it shows that 43% of the respondents came to know about the environmental sustainability initiatives of Indian Railways through social

media, 29% of the respondents became aware at railway station, 21% learned during train travel and 7% of the respondents came to know through media or news sources.

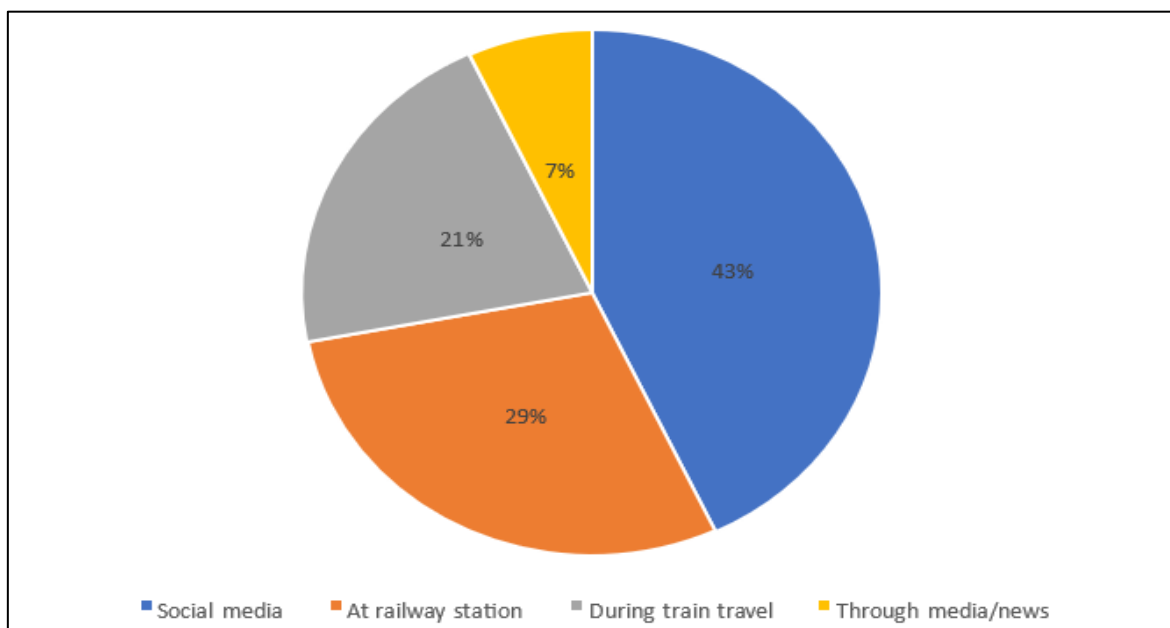


Fig 1 Majority of the Respondents came to Know Through Social Media (43%).

➤ *Chi-Square*

- (H₀): There is no significant association between the age group of the respondents and their familiarity with the

term environmental sustainability in the context of Indian Railways.

Table 2 Chi-Square

AGE GROUP	I have understand clearly	I have a basic idea	I have heard the term but don't know details	I have never heard this term before	TOTAL	PERCENTAGE
Below 20	3	0	9	7	19	19%
21-30 years	1	3	5	8	17	17%
31-40 years	3	10	16	24	53	53%
Above 40 years	1	3	1	6	11	11%
Total	8	16	31	45	100	100%

CHI-SQUARE VALUE	TABLE VALUE	DEGREE OF FREEDOM	RESULT
10.021	16.919	9	Accepted

➤ *Interpretation*

The calculated chi-square value (10.021) is less than the table value (16.919), hence the null hypothesis is accepted at 5% level of significance. It can be concluded that there is no significant association between Age Group of the Respondents and their Familiarity with the Term Environmental Sustainability in the Context of Indian Railways.

V. FINDINGS

- Majority of the respondents came to know through social media (43%).
- Chi -square: From the chi-square analysis it is concluded that there is no relationship between Age group and level of familiarity in level of familiarity of respondents with the term environmental sustainability in the context of Indian railways

VI. SUGGESTION

- 43% of respondents learned about sustainability initiatives through social media, Indian Railways should use platforms like Instagram, Facebook, and YouTube more actively to promote green initiatives and environmental responsibility.
- Railway stations should have informational boards explaining sustainability initiatives, such as water conservation, energy efficiency, and waste management systems.
- Indian Railways can introduce passenger participation programs, such as reward systems or recognition for passengers who follow eco-friendly practices.

VII. CONCLUSION

The study examines passengers' awareness and perception of environmental sustainability practices in Indian Railways. Most respondents are aged 21–30, mainly female,

married, and living in urban areas. Many passengers prefer passenger trains and general class because they are affordable. A good number of passengers are aware of sustainability practices like waste segregation bins and plastic control at stations. Social media has helped increase awareness about these eco-friendly initiatives. Overall, while Indian Railways has taken positive steps toward sustainability, improvements in cleanliness and implementation are still needed.

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