

A Study on Land-based Vehicle Users' Awareness of Carbon Emission and Its Impact on Buying Behavior in Coimbatore City

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Abstract:

This study explores the awareness of land-based vehicle users in Coimbatore about carbon emissions and its impact on vehicle purchasing behavior. Data from 75 respondents reveal that while environmental awareness exists, it has limited influence on buying decisions, with cost and fuel station availability being more significant factors. The research underscores the importance of social media in raising awareness and suggests strategies like expanding EV charging infrastructure, promoting eco-friendly technologies, and increasing public awareness campaigns to encourage sustainable transportation choices.

Keywords — Vehicle users, carbon emissions, eco-friendly technologies

I. INTRODUCTION

Carbon, the fourth most common element in the universe, readily combines with other materials, including carbon dioxide (CO₂). CO₂, produced by burning carbon fuels, is a major pollutant due to its environmental impact. Around 90% of global carbon emissions stem from burning fossil fuels for electricity, heat, and transport. This study focuses on transportation, specifically land-based vehicles, which are a subset of land-based transportation alongside railways and pipelines.

The Indian Government has implemented initiatives like the FAME scheme and Bharat Stage emission standards to curb transport-related emissions. Transitioning to electric vehicles (EVs) is a key solution, as India's EV fleet could prevent 5 million tons of CO₂ emissions, with projections of up to 380 Mt by 2050.

Coimbatore, a rapidly growing industrial city in India, faces rising pollution due to urbanization. This study examines the awareness of carbon emissions among land-based vehicle users in Coimbatore and its influence on their vehicle purchase decisions.

II. OBJECTIVES

- ❖ To evaluate the level of awareness among land-based vehicle user's of various demographic variables.
- ❖ To examine how awareness of carbon emission influences the buying behavior of land-based vehicle users'.

III. STATEMENT OF THE PROBLEM

In rapidly developing urban centers like Coimbatore, rising road transport ownership necessitates assessing vehicle users' awareness of their environmental impact. This study investigates the level of awareness among land-based vehicle users in Coimbatore regarding

carbon emissions and examines how this awareness influences their purchasing decisions.

IV. SCOPE OF THE STUDY

This study examines the awareness of land-based vehicle users in Coimbatore regarding carbon emissions and its influence on their purchasing decisions. It aims to determine whether environmental concerns significantly impact vehicle preferences. By focusing on Coimbatore, the study offers localized insights to help policymakers, manufacturers, and marketers promote sustainable transportation choices.

V. HYPOTHESIS

Null Hypothesis (H₀): There is no significant relationship between land-based vehicle users' awareness of carbon emissions and their buying behavior in Coimbatore city.

Alternative Hypothesis (H₁): There is a significant relationship between land-based vehicle users' awareness of carbon emissions and their buying behavior in Coimbatore city.

VI. RESEARCH METHODOLOGY

The study on land-based vehicle users' awareness of carbon emission and its impact on buying behavior in Coimbatore city employs the following research methodology.

VII. SOURCE OF DATA

❖ PRIMARY DATA

The primary data will be collected through a structured questionnaire designed to address the research objectives.

❖ Secondary data

Secondary Data for the study have been collected from Journals, Articles and required websites.

VIII. SAMPLING TECHNIQUE

The study will use stratified random sampling. Participants are chosen based on the factors that they are at or above the age of driving a vehicle, ensuring that the sample is representative of land-based vehicle users' who can provide valuable information on awareness of carbon emission and its impact on buying behavior.

SAMPLING SIZE

A sample of 75 respondents was taken for the study.

RESEARCH DESIGN

The Research Design employed in this study is Descriptive Research Design.

AREA OF THE STUDY

The study will be conducted in the city of Coimbatore, located in the state of Tamil Nadu, India.

TOOLS USED FOR THE STUDY

❖ Percentage Analysis

LIMITATIONS OF THE STUDY

1. The study is restricted to Coimbatore, which might limit the generalizability of findings to other regions with different socio-economic or cultural contexts.
2. The study focuses on land-based vehicle users' only which again might limit the generalizability of findings to other modes of transport and its users,.
3. Reaching a representative sample of vehicle users' in Coimbatore across all demographics may be challenging.
4. Consumer behavior and awareness levels may evolve over time, making the findings the relevant primarily to the study's time.

IX. REVIEW OF LITERATURE

1. Jay Bhasin and Dr. Nandini Srivatsava (2024), in their study "A Study of Select Variables Impacting Buying Behaviour of Electric Cars in India," examine factors influencing Indian

consumers' purchasing decisions for electric cars. Using quantitative methods, they surveyed 300 respondents across various demographics. The analysis highlights that environmental awareness, perceived cost-efficiency, and government incentives significantly influence buying behavior. However, inadequate charging infrastructure and high initial costs remain major barriers. The study recommends addressing infrastructure challenges and improving consumer education to promote electric car adoption.

2. Siddhart Jain and Shalini Rankavat (2023), in their study “Analysing Driving Factors of India’s Transportation Sector CO2 Emissions: Based on LMDI Decomposition Method,” use the Tapio index decomposition model and the logarithmic mean Divisia index (LMDI) method to analyze CO2 emissions in India's transportation sector. The study reveals that emissions rose from 155.9 Mt in 2001 to 368.7 Mt in 2020, with a CAGR of 4.6%. Road transportation is identified as the primary contributor, highlighting the need for strategies to decouple economic growth from carbon emissions amidst rising transportation demands.

PERCENTAGE ANALYSIS

Demographic and socio-economic factors of the respondents

Highest Educational Qualification:		
Higher Secondary	9	12
Undergraduate	52	69.33
Post Graduate	10	13.33
Professional Course	4	5.33
Occupation:		
Student	49	65.33
Employed	22	29.33
Homemaker	3	4
Unemployed	1	1.33
Retired	0	0
Monthly Income:		
Below 10000	40	53.33
10000 - 30000	13	17.33
30000 - 60000	12	16
Above 60000	10	13.33
Marital Status:		
Married	16	21.33
Unmarried	59	78.67
Total	75	100

Interpretation:

The demographic and socio-economic analysis of the study reveals a diverse participant profile. The majority respondents are male (54.67 %), falling within the age group of 18 - 28 years (84 %). Education distribution indicates a significant proportion holding Bachelor’s degrees (69.33%). The occupation spectrum is represented by students (65.33%), with a smaller percentage of homemakers (4%) and employees (29.33%). In terms of monthly income majority fall in the below 10000 bracket (53.33%). This demographic diversity ensures a broad representation of perspectives on land-based vehicle users’

Particulars	No.of Respondents	Percentage
Gender:		
Male	41	54.67
Female	34	45.33
Age:		
18 to 28 years	63	84
29 to 38 years	5	6.67
39 to 49 years	4	5.33
50 years and above	3	4

awareness of carbon emission and its impact on their buying behavior.

Primary contributor to carbon emission from land-based vehicles	Respondents
Petroleum	48 (64%)
Diesel	19 (25.33%)
Air Conditioner Wind	7 (9.33%)
Wind Resistance	1 (1.33%)
Primary environmental impact of carbon emission from land-based vehicles	Respondents
Increased Oxygen levels	11 (14.6%)
Global Warming and Climate change	61 (81.33%)
Enhanced Biodiversity	2 (2.67%)
Reduced soil fertility	1 (1.33%)
Familiarity with eco-friendly vehicle technologies like electric and hybrid vehicles	Respondents
4 - Very familiar	23 (30.67%)
3 - Somewhat familiar	23 (30.67%)
2 - Heard about them but unsure of details	18 (24%)
1 - Not familiar at all	11 (14.67%)
Awareness regarding government regulations aimed at reducing vehicle emissions (e.g., BS VI emission standards, FAME scheme)	Respondents
Yes	31 (41.33%)
No	22 (29.33%)
Not sure	22 (29.33%)
Source of information that influences the respondents understanding of carbon emission from vehicles	Respondents
Manufacturer Information	8 (10.6%)
Government Campaigns	12 (16%)
	37 (49.33%)

Social Media	12 (16%)
News Outlets	5 (6.67%)
Friends/Family	1 (1.33%)
Others	
Importance that vehicle you purchase has a low carbon footprint	Respondents
5 - Extremely Important	25 (33.33%)
4 - Important	25 (33.33%)
3 - Moderately Important	16 (21.33%)
2 - Not Important	4 (5.33%)
1 - Extremely Not Important	5 (6.67%)
Influence of vehicle carbon emission rating when purchasing a vehicle	Respondents
5 - Extremely Influential	13 (17.33%)
4 - Influential	26 (34.67%)
3 - Neutral	29 (38.67%)
2 - Not Influential	4 (5.33%)
1 - Not at all Influential	3 (4%)
Willingness to pay more for a vehicle with lower carbon emissions	Respondents
Yes	26 (34.67%)
No	12 (16%)

Depends on the price difference	37 (49.33%)
Reason to prefer engine vehicles over e-vehicles	Respondents
More fuel stations	29 (38.67%)
Peer Influence	11 (14.67%)
Cost of engine vehicles	20 (26.67%)
Driving range	15 (20%)
Total	75 (100%)

Interpretation:

The questionnaire used to assess respondents' awareness and its impact on buying behavior reveals that users are largely aware of carbon emissions and their environmental impact. However, while this awareness is considered during vehicle purchases, it is not the primary

X. FINDINGS

- ❖ From the study, when it comes to the awareness of vehicle users' awareness with regards to carbon emission and its environmental impact, majority of the respondents are aware of the cause and effect of carbon emission.
- ❖ When it comes to the awareness of the respondents regarding eco-friendly vehicle technologies and government regulations aimed at reducing carbon emission, less than half of the respondents are aware of such measures. Also social media is playing a pivotal role in influencing the understanding of carbon emission among vehicle users'
- ❖ When it comes to the point whether the awareness influences the vehicle users' purchase decision, the study conveys that it is not that influential. More fuel stations and cost of engine vehicles play a crucial factor

for users' to prefer engine vehicles over e-vehicles.

XI. SUGGESTIONS

- ❖ More EV charging stations should be setup and made available to vehicle users' as it helps them continue using the vehicle and also influences them to purchase it.
- ❖ Electric vehicles are environmental friendly in the same way the batteries which are used in those e-vehicles should also be manufactured and produced in such a manner that it causes less or nil harm to the environment.
- ❖ A lot of education and awareness lectures and campaigns should be provided to vehicle users' about benefits of reducing carbon emission, electric and hybrid vehicles and also about government incentives and schemes.

XII. CONCLUSION

In conclusion, this study highlights the diverse awareness levels among vehicle users in Coimbatore and its limited impact on purchasing behavior. Key factors influencing electric vehicle adoption include EV charging infrastructure availability and educational campaigns on carbon emissions and e-vehicles. The research emphasizes the need for improved EV charging stations, eco-friendly battery production, and awareness initiatives to promote sustainable consumer behavior. It provides a foundation for future research on urban sustainable practices and policy development.

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