Customers Perception on Electric Vehicles in Coimbatore District

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ABSTRACT

This study examines customers' perception of electric vehicles (EVs) in the Coimbatore. EVs, powered by one or more electric motors and producing zero tailpipe emissions, are increasingly viewed as sustainable alternatives to conventional vehicles. Growing environmental concerns, government incentives, and rising fuel prices have accelerated consumer interest in electric mobility. India's expanding EV market, supported by a large consumer base, skilled labour, and comparatively lower production costs, has also attracted global manufacturers to establish operations in the country.

Adopting a descriptive research design, this study collected primary data from 250 respondents in Coimbatore using a structured questionnaire. The analysis highlights both positive and negative factors shaping consumer perception, including environmental awareness, cost considerations, technological acceptance, and purchase intentions. The findings provide useful insights for policymakers and automobile manufacturers to enhance strategies for promoting EV adoption in emerging urban markets.

Keywords: Electric Vehicles, Consumer Perception, Environmental Awareness, Technology, Purchase Intentions

INTRODUCTION

Globally, the electric vehicle (EV) sector has been witnessing rapid growth, with a compounded annual growth rate (CAGR) of 21.7 percent. By 2030, EV adoption is expected to rise significantly from 8.1 million to 39.21 million units. This growth is primarily driven by efficiency, rising fuel costs, environmental concerns, and government policies aimed at reducing carbon emissions. Worldwide, governments are encouraging the EV industry through subsidies, incentives, and regulatory measures, as consumers increasingly prefer sustainable alternatives over conventional petroleum and diesel vehicles.

In India, the shift toward EVs has gained momentum in recent years, supported by technological advancements and government initiatives. While electric vehicles were first introduced in the 19th century, their adoption was initially limited due to high costs, shorter range, and lower performance. However, with growing awareness of environmental issues and rising fuel prices, consumers are now showing greater interest in EVs. Today, although EVs represent a smaller proportion of vehicles on Indian roads compared to conventional vehicles, the industry is positioned to achieve significant growth. The Government of India's initiatives, such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme and the vehicle scrappage policy, have further accelerated EV adoption. In the Union Budget 2023, the allocation for FAME was increased to ₹2,908 crores, reflecting the government's commitment to clean mobility.

In Tamil Nadu, and specifically in Coimbatore, EV adoption is gradually gaining attention due to the city's urban growth, increasing consumer awareness, and the presence of a strong automobile and manufacturing ecosystem. Collaborations between the government and manufacturers such as Tata Motors, Mahindra,

Hyundai, and other players have been pivotal in expanding the EV market. Consumer perception in Coimbatore is influenced by factors such as cost, technology, environmental benefits, and service quality. The positive impacts of innovation, coupled with government support, have shaped more favorable attitudes towards EVs, though challenges related to affordability, charging infrastructure, and performance continue to exist.

Consumer perception is a crucial aspect in understanding the growth potential of EVs. It encompasses the beliefs, attitudes, and assumptions that customers hold about the product. While some consumers perceive EVs as eco-friendly and cost-saving, others may be skeptical about their convenience or reliability. This study, conducted by, focuses on analyzing customers' perception of electric vehicles in the Coimbatore district. It aims to identify the key factors influencing adoption, awareness, and purchase decisions, thereby providing insights for manufacturers, policymakers, and stakeholders to strengthen EV strategies in the region.

REVIEW OF LITERATURE

The transportation sector has been under constant pressure to adopt cleaner and more sustainable technologies due to rising environmental concerns. Chan (2002) emphasized that electric vehicles (EVs) represent a viable solution to reduce pollution, with batteries being the most critical component in ensuring cost-effectiveness and everyday usability. Hoyer (2008) observed that although electric vehicles had existed for more than a century, their adoption was initially limited due to the convenience and dominance of internal combustion engines. However, increasing oil scarcity, environmental concerns, and advancements in battery technology have revived interest in EVs, enabling them to compete more effectively with conventional vehicles.

In the Indian context, government policies and incentives have played a significant role in shaping consumer attitudes. Mehta (2021) analyzed India's EV policies and highlighted measures such as income tax rebates on EV loans, exemptions on lithium-ion cell imports, and the scrappage policy. These steps aimed to make EVs more affordable and accelerate their adoption. Nevertheless, challenges such as inadequate charging infrastructure and limitations in battery technology continue to hinder large-scale adoption. Similarly, Dash (2013) stressed the importance of localized planning for charging infrastructure and the integration of energy and transport sectors, suggesting that financial incentives like tax credits, subsidies, and toll exemptions could boost consumer acceptance.

Studies have also explored consumer behaviour and perceptions. Gandhi and Joshi (2019), in their comparative analysis of electric cars and two-wheelers in Mumbai, found that affordability and ease of charging were key factors influencing two-wheeler adoption, whereas electric car buyers were more concerned about range and infrastructure. Raj and Kapoor (2018) highlighted the positive role of government incentives in influencing consumer attitudes, noting that awareness of subsidies and schemes increased purchase intentions. Singh and Patel (2020) examined psychological aspects and found that perceived prestige, social influence, and personal values significantly shaped consumer attitudes toward EVs. These findings suggest that consumer decision-making extends beyond cost and technology to include socio-psychological factors.

More recent research has focused on consumer awareness and barriers to adoption. Adhikary, Jalan, and Anute (2022) reported that while consumers are increasingly aware of the environmental benefits of EVs, concerns such as affordability, infrastructure, and after-sales service remain significant obstacles. Ghasri et al. (2019) and Sierzchula et al. (2014) further emphasized that consumer preferences are influenced by a combination of financial, technical, and political factors, underscoring the importance of coordinated government and industry efforts to encourage adoption.

Although several studies have examined consumer perceptions in metropolitan cities such as Mumbai and Delhi, there is limited literature addressing regional contexts like Coimbatore. As an industrial hub of Tamil Nadu, Coimbatore presents a unique mix of urban growth, rising environmental awareness, and a developing automobile ecosystem. This study addresses the existing research gap by focusing on customers' perception of

electric vehicles in the Coimbatore district, providing insights into local consumer behavior and adoption patterns.

RESEARCH METHODOLOGY

The review of literature discussed in the previous chapter forms the basis for developing the theoretical framework of this study. In order to analyze customers' perception of electric vehicles in the Coimbatore district, seven key factors have been integrated into the framework. These factors help in understanding the awareness, attitudes, and behavioural intentions of consumers toward EV adoption.

This study relies on both primary and secondary sources of information. Primary data were collected through a structured questionnaire distributed to respondents in the Coimbatore district, while secondary data were obtained from journals, research articles, reports, and policy documents related to electric vehicles. The collected data are systematically presented in relevant tables and charts in this report to support analysis and interpretation.

RESEARCH OBJECTIVES

- To study customers' perception towards electric vehicles in the Coimbatore district.
- To identify the key factors influencing customers' decision to purchase electric vehicles.
- To evaluate the role of government initiatives and promotional measures in encouraging EV adoption.
- To examine the contribution of manufacturers in promoting and producing electric vehicles.
- To analyze the relationship between demographic variables such as gender, age, and income and customers' perception of electric vehicles.

RESEARCH DESIGN

A cross-sectional correlation field study research design was adopted, as the primary objective of this research was to analyze customers' perception and attitude towards electric vehicles in the Coimbatore district. The items for the study were identified through an extensive review of literature, supported by established theories and prior empirical findings.

Primary data were collected using a structured questionnaire. All items were measured on a 5-point Likert scale, where 1 represented Strongly Disagree and 5 represented Strongly Agree. The questionnaire was subjected to tests of validity and reliability to ensure accuracy and consistency of measurement. Internal consistency of the items across dimensions was assessed using Cronbach's alpha, with a cut-off value of 0.7 adopted as the acceptable threshold.

SAMPLING TECHNIQUE

The study employed a non-probability purposive/convenience sampling technique to select respondents. A total of 250 samples were collected from customers in the Coimbatore district to assess their perception towards electric vehicles.

DATA COLLECTION

Primary data were gathered through a structured questionnaire distributed to respondents in Coimbatore. The questionnaires were carefully screened for completeness and consistency, and only fully completed responses were considered for analysis. Secondary data were also referred from journals, articles, and reports to support the study.

TOOLS FOR ANALYSIS

The collected data were analyzed using both descriptive and inferential statistical methods. The results are presented through frequency tables, pie charts, and cross-tabulations. Advanced statistical tests such as Linear Regression, ANOVA, and Chi-Square were applied using the Statistical Package for Social Sciences (SPSS).

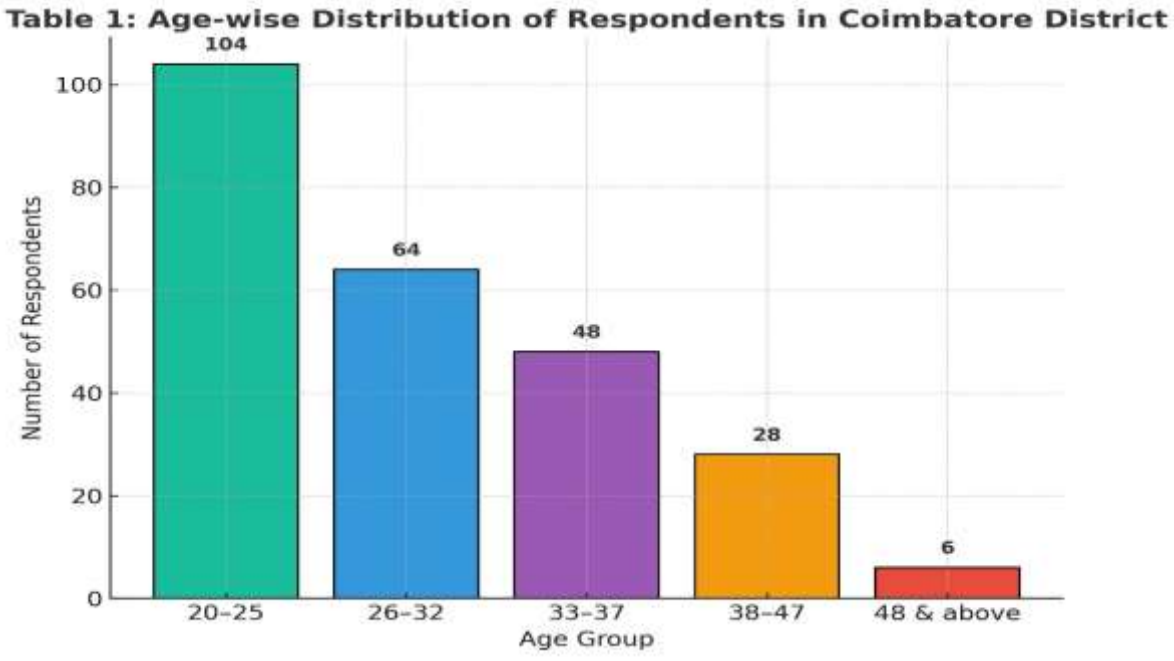
The questionnaire was designed to capture both qualitative and quantitative data. Its primary objective was to evaluate factors influencing customer perception, such as pricing, environmental benefits, financial savings, peer influence, and reduced noise levels, which collectively shape the adoption of electric vehicles in a positive manner.

DATA ANALYSIS

Descriptive Statistics The demographic profile of respondents from the Coimbatore district is presented below. A total of 250 valid responses were analyzed.

Table 1: Age-wise Distribution of Respondents in Coimbatore District

Age Group	Responses
20–25	104
26–32	64
33–37	48
38–47	28
48 & above	6
Total	**250**



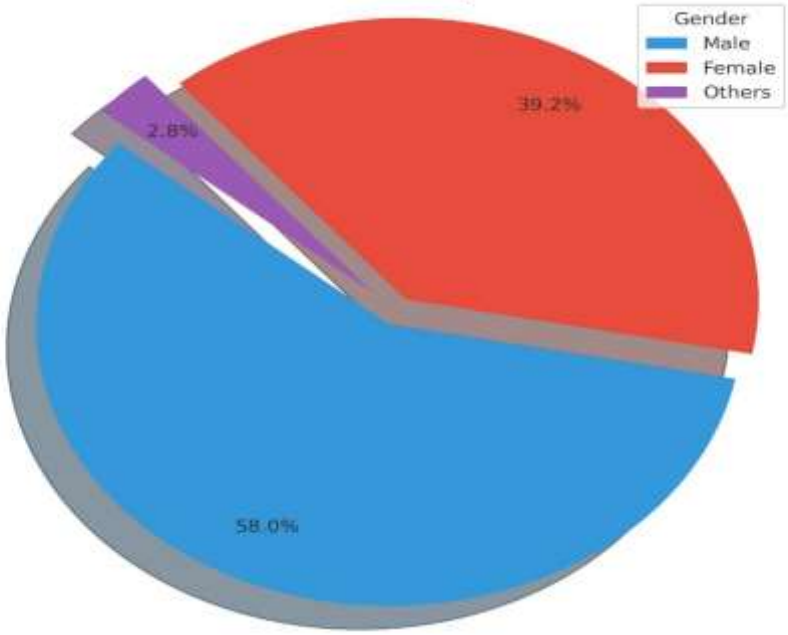
Interpretation: The majority of respondents (168 out of 250, i.e., 67.2%) fall within the age group of 20–32 years, showing that younger consumers dominate the study and are more receptive to EV adoption.

Table 2: Gender-wise Distribution of Respondents in Coimbatore District

Gender	Responses
Male	145
Female	98
Others	7

Total	**250**

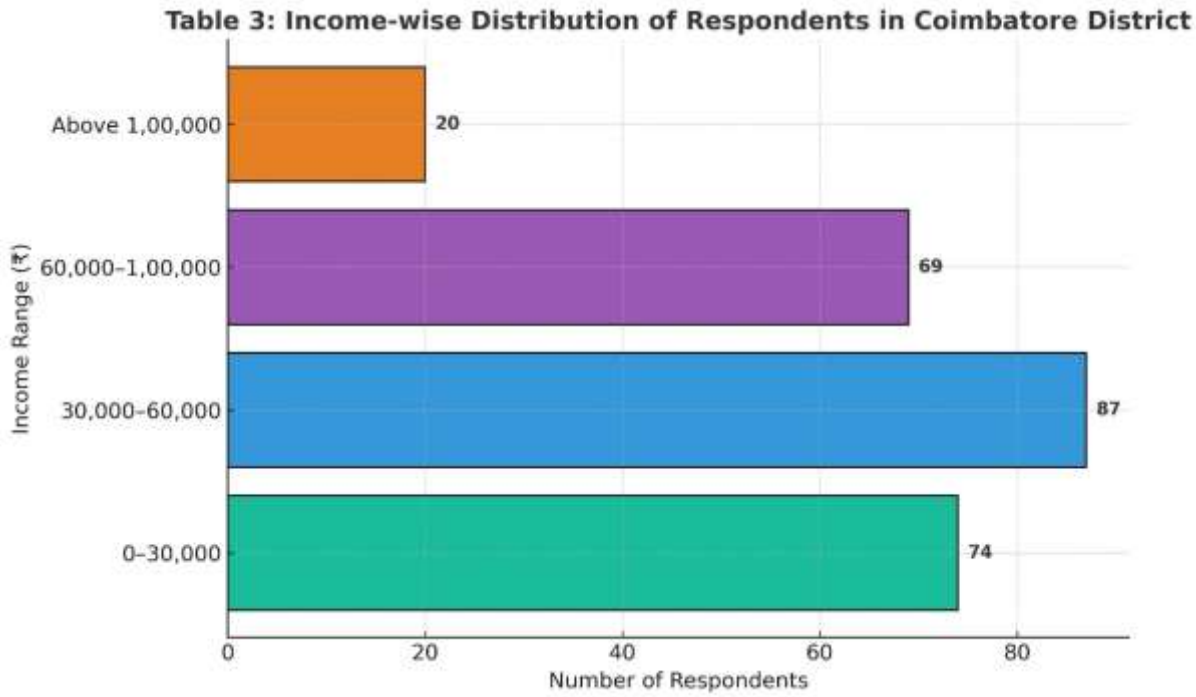
Table 2: Gender-wise Distribution of Respondents in Coimbatore District



Interpretation: Male respondents (58%) slightly outnumber female respondents (39%), but both genders show significant participation, suggesting broad consumer interest in EVs.

Table 3: Income-wise Distribution of Respondents in Coimbatore District

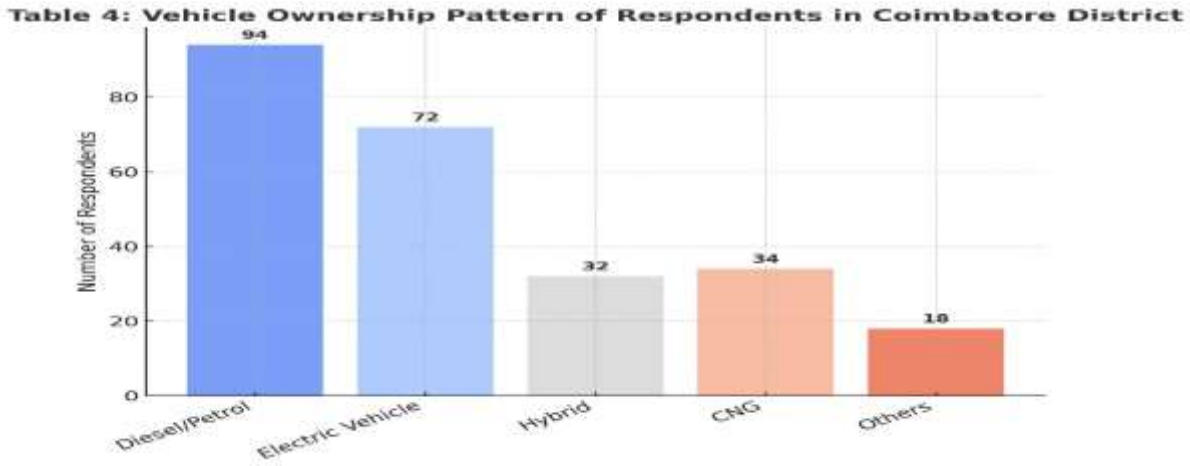
Income Range (₹)	Responses
0–30,000	74
30,000–60,000	87
60,000–1,00,000	69
Above 1,00,000	20
Total	**250**



Interpretation: Middle-income groups (₹30,000–1,00,000) account for 62.4% of the sample, showing that affordability and value-for-money strongly influence EV perception in Coimbatore.

Table 4: Vehicle Ownership Pattern of Respondents in Coimbatore District

Type of Vehicle	Responses
Diesel/Petrol	94
Electric Vehicle	72
Hybrid	32
CNG	34
Others	18
Total	**250**



Interpretation: Conventional petrol/diesel vehicles (37.6%) remain the most owned, but nearly 29% of respondents already own EVs. The adoption of hybrids and CNG vehicles reflects a transitional shift toward sustainable mobility in Coimbatore.

HYPOTHESIS TESTING

Hypothesis 1

- H_{01}: There is no significant difference in perception towards electric vehicles across different age groups.
- H_{a1}: There is a significant difference in perception towards electric vehicles across different age groups.

Test Summary

Null Hypothesis	Test	Sig.	Decision
The distribution of average perception is the same across categories of Age.	Independent-Samples Kruskal-Wallis Test	0.000	Reject the Null Hypothesis

Interpretation: Since the significance value is 0.000, which is less than the 0.05 threshold, the null hypothesis is rejected. This indicates that perceptions of electric vehicles vary significantly across different age groups in Coimbatore district.

Hypothesis 2

- H_{02}: There is no significant difference in perception towards electric vehicles across gender.
- H_{a2}: There is a significant difference in perception towards electric vehicles across gender.

Test Summary

Null Hypothesis	Test	Sig.	Decision
The distribution of average perception is the same across categories of Gender.	Independent-Samples Kruskal-Wallis Test	0.137	Retain the Null Hypothesis

Interpretation: The significance value is 0.137, which is greater than 0.05. Therefore, the null hypothesis is retained. This implies that perceptions of electric vehicles do not differ significantly between male, female, and other gender categories in Coimbatore district.

Hypothesis 3

- H_{03}: There is no significant difference in perception towards electric vehicles across different income groups.
- H_{a3}: There is a significant difference in perception towards electric vehicles across different income groups.

Test Summary

Null Hypothesis	Test	Sig.	Decision
The distribution of average perception is the same across categories of Income.	Independent-Samples Kruskal-Wallis Test	0.041	Reject the Null Hypothesis

Interpretation: The significance value is 0.041, which is less than 0.05. Hence, the null hypothesis is rejected. This suggests that consumer perceptions towards electric vehicles differ significantly across income groups in Coimbatore district.

FINDINGS

- Many consumers in Coimbatore lack adequate knowledge about EVs, creating uncertainty in purchase decisions.
- Key concerns remain driving range, charging infra, and cost of ownership.
- 86.8% of respondents are aware of EVs, primarily via social media.
- 57.6% agree EVs are eco-friendly and city-suitable.
- Younger respondents (20–32 years) form the largest adoption group (67.2%).
- High-income groups show stronger purchase inclination, confirming affordability's role.
- Nearly 29% of respondents already own an EV, showing growing traction.
- Hypothesis testing shows significant differences in perception across age and income groups, but not across gender.
- Education and income level also influence the decision to adopt EVs.

SUGGESTIONS AND RECOMMENDATIONS

Enhance Consumer Awareness

- Conduct campaigns highlighting environmental benefits and cost savings of EVs.
- Use social media and digital platforms to reach younger consumers.

Expand Product Variety

- Introduce EV models across different price ranges to suit all income groups.
- Develop compact city-friendly EVs for middle-class buyers and premium models for high-income groups.

Improve Charging Infrastructure

- Increase the number of charging stations across Coimbatore.
- Install fast-charging points in residential areas, shopping complexes, and highways.

Strengthen Government Policy Support

- Provide subsidies, tax rebates, and reduced road taxes for EV buyers.
- Enhance the effectiveness of the FAME-II scheme in Coimbatore district.

Address Cost Barriers

- Offer flexible financing options and low-interest EV loans.
- Promote local battery and component manufacturing to reduce costs.

Targeted Consumer Segments

- Focus on younger consumers (20–32 years) as the largest adoption group.
- Launch women-focused campaigns due to high awareness and interest among female respondents.

After-Sales Service and Trust Building

- Strengthen service networks to ensure reliability and customer satisfaction.

- Provide extended warranties on batteries and motors to address durability concerns.

CONCLUSIONS

The study on customers' perception of electric vehicles (EVs) in Coimbatore District, based on 250 respondents, reveals a growing awareness and interest in sustainable mobility among consumers. Younger respondents, particularly those aged 20–32 years, show greater receptiveness toward EV adoption, while higher-income groups also display a stronger inclination to invest in EVs due to long-term cost savings and environmental benefits. However, concerns regarding limited charging infrastructure, high initial purchase costs, and restricted model availability continue to act as barriers to widespread adoption.

These findings indicate that consumer perception is shaped by both motivating and discouraging factors, reflecting a dual outlook toward EVs in the district. Despite these challenges, the study concludes that EV adoption in Coimbatore has strong potential to accelerate if supported by effective government initiatives, improved infrastructure, and targeted awareness programs. The shift towards electric mobility is not only perceived as a solution to reduce pollution and carbon emissions but also as an opportunity for cost efficiency in the long run. Strengthening policies, encouraging manufacturers to diversify EV models, and expanding charging facilities will be essential in transforming positive perceptions into actual consumer adoption, thereby contributing to the region's sustainable development goals.

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