International Journal of Research in Management & Social Science
Volume 13, Issue 4 October - December 2025
ISSN 2322 - 0899

CONSUMER BUYING BEHAVIOUR TOWARDS ELECTRIC VEHICLE IN INDIA: TRENDS, INFLUENCES AND CHALLENGES

Dr . Madireddi S S V Srikmar[1], N.Harivardhan Reddy[2], K. Akhil Goud[3] and Chandrakinth Reddy[4]
[1]Associate Professor, Koneru Lakshmaiah Educational foundation, Hyderabad.
[2,3,4]Student, BBA – III year, Koneru Lakshmaiah Educational foundation, Hyderabad

ABSTRACT
The transition towards electric mobility in India has accelerated in recent years, supported by government initiatives, technological advancements, and rising environmental consciousness among consumers. However, the pace of adoption varies significantly across segments, regions, and consumer groups. Understanding consumer buying behaviour is therefore critical for identifying the drivers and barriers influencing the purchase of electric vehicles (EVs). This study provides a comprehensive analysis of the trends shaping India's EV market, including increasing model availability, growth in two- and threewheeler electrification, and expanding infrastructure investments. It also examines the key factors that influence consumer decisions, such as price sensitivity, perceived economic benefits, environmental attitudes, trust in technology, social influence, access to charging facilities, and perceived performance of EVs.

Despite positive growth indicators, adoption continues to be hindered by several challenges, including high initial costs, insufficient and unevenly distributed charging infrastructure, range anxiety, lack of awareness regarding EV benefits, and concerns about battery lifespan and resale value. By synthesizing these trends, influences, and challenges, the study highlights the behavioural patterns shaping EV adoption in India. The findings aim to support policymakers, manufacturers, and stakeholders in formulating targeted strategies— such as strengthening charging ecosystems, improving affordability, enhancing consumer awareness, and offering innovative financing models—to accelerate the transition towards sustainable electric mobility in India.

Keywords: *Electric Vehicles (EVs), Consumer Buying Behaviour, India, EV Adoption, Charging Infrastructure.*

INTRODUCTION
India is experiencing a significant shift in its transportation landscape as electric vehicles (EVs) emerge as a sustainable alternative to conventional internal combustion engine (ICE) vehicles. Growing environmental concerns, rising fuel prices, and the global push towards cleaner mobility have accelerated interest in EVs among Indian consumers. The Government of India has also introduced various initiatives—such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, reduced GST rates on EVs, and incentives for charging infrastructure—to encourage widespread adoption. As a result, the Indian EV market has shown considerable growth, especially in the two-wheeler and three-wheeler segments, with gradual expansion in the passenger car segment.

Despite this progress, consumer adoption of EVs is influenced by several complex factors. Buyers evaluate not only economic aspects such as purchase price, maintenance cost, and long-term savings, but also psychological and functional factors such as range anxiety, trust in new technology, perceived environmental benefits, and convenience of charging. Social influences, lifestyle needs, and awareness levels further shape consumer attitudes and intentions toward EVs. However, challenges such as limited public charging infrastructure, high upfront costs, uncertainty about battery performance, and concerns over resale value continue to hinder mass adoption, particularly in middle- and lower-income groups.

Understanding consumer buying behaviour is therefore essential for policymakers, manufacturers, and service providers seeking to accelerate EV adoption in India. By examining current market trends, key determinants influencing consumer decisions, and the challenges that restrict greater acceptance, this study aims to provide meaningful insights into how India can move toward a more sustainable and inclusive electric mobility ecosystem.

NEED FOR THE STUDY
The rapid global shift toward sustainable transportation has placed electric vehicles (EVs) at the forefront of future mobility solutions. In India, although EV adoption is growing, it remains uneven and significantly lower compared to global benchmarks. Understanding consumer buying behaviour is therefore crucial for identifying the factors that encourage or discourage EV purchases. This study is needed to bridge the existing knowledge gap regarding how Indian consumers perceive EVs, what influences their purchase decisions, and what barriers prevent them from transitioning from conventional vehicles to electric alternatives.

The study is essential because the Indian EV market is still evolving, and consumer attitudes are shaped by diverse socio-economic conditions, varying levels of awareness, and differing access to technology and infrastructure. Issues such as high initial cost, limited charging facilities, range anxiety, and uncertainty about battery life continue to affect adoption rates. By analysing these factors, the study can help policymakers design more effective incentive schemes, guide manufacturers in developing consumercentric EV models, and support stakeholders in improving charging infrastructure.

Furthermore, with India aiming to reduce carbon emissions, lower dependence on imported fuel, and promote sustainable mobility, understanding consumer behaviour becomes strategically important. Insights from this study will contribute to designing targeted interventions that can accelerate EV adoption and support India's transition toward cleaner, greener, and more efficient transportation systems.

LITERATURE REVIEW

This literature review synthesizes recent empirical studies, policy analyses and market reports (2019–2025) to identify what is known about Indian consumer behaviour toward EVs, recurring themes, and gaps for further research. Citations indicate representative, high-quality sources used to support major points**.**

(P. K. Dash, 2013) Potential Need for Electric Vehicles, Charging Station Infrastructure, and Challenges for the Indian Market: by Praveen Kumar and Kalyan Dash: India could invest in small scale reinforcements to control load concerns locally rather than attempting a massive overhaul. The practise of charging should be encouraged. Place, population, traffic density, and safety should all be carefully planned. Before putting in place a large-scale charging infrastructure, thinking about it will be very important and the importance of blending of activities. It is crucial in the domains of energy and transportation. Various inventive methods are used to achieve development goals. Drivers of electric automobiles, for example, are offered a financial consumer incentive through regulations and initiatives. tax credits, purchasing subsidies, low tolls, free parking, and access to limited interstate lanes are just some of the options available. will contribute to the market's expansion and will really help India in taking a big step towards becoming Electric Vehicle centric country.

(Anable & Morton, 2016) concentrated on understanding consumer response to EVs by evaluating whether consumer innovativeness relates to the expressed preference towards EVs. He defined consumer innovativeness as a consumer's innate and revealed willingness to accept new items with different or more sophisticated features and functionalities. The technical specifications of electric vehicles differ significantly from those of vehicles powered by internal combustion engines**.**

(Pretty Bhalla, 2018) A Study of Consumer Perception and Purchase Intention of Electric Vehicles: Pretty Bhalla, Inass Salamah Ali, Afroze Nazneen: Environmental concerns, cost, comfort, trust, technology, societal acceptance, and infrastructural availability all influence car selection. These arguments have been put to the test in both conventional and electric vehicles. They believe that these elements have a direct impact on an individual's vehicle choice. They discovered that EV producers and governments must invest more in social acceptability of the car by expanding infrastructure and emphasising technology to build trust. According to the findings, the general public is fully aware of the environmental benefits. The government and manufacturers share responsibility for investing in car manufacturing.

(Tornekar, 2020) stated the eight possible reasons for the slow growth of EVs in India. He mentioned charging time, price of an EV, range depending on battery capacity, charging infrastructure, limited life of batteries, fear of new technology, government incentives, lack of advertisements, and awareness campaigns as the obstacles to EVs growth in India.

OBJECTIVES OF THE STUDY

- ➢ To study the awareness about electric vehicles in Himachal Pradesh.
- ➢ To know the factors influencing customers to purchase electric vehicles.
- ➢ To know the factors affecting customers to purchase electric vehicle.
- ➢ To study government initiatives taken to promote electric/hybrid vehicles.
- ➢ To identify the challenges of electric vehicles in HP as well as in whole India.

RESEARCH GAP

Although electric vehicle (EV) adoption in India has gained significant momentum, existing literature reveals several gaps that limit a complete understanding of consumer buying behaviour. Most available

ISSN 2322 - 0899

studies primarily focus on urban and metropolitan consumers, leaving limited insights into rural, semiurban, and tier 2/3 markets, where awareness, affordability, and infrastructure issues differ significantly. Similarly, a large proportion of research relies on cross-sectional surveys, which capture only short-term perceptions and do not track how consumer attitudes change over time as technology and charging infrastructure evolve.

Another key gap lies in the overemphasis on economic and environmental factors, while deeper behavioural aspects—such as trust in battery technology, perceived risk, lifestyle compatibility, social influence, and experiential learning—remain underexplored. There is also a lack of studies examining post-purchase behaviour, including satisfaction, usage patterns, and word-of-mouth influence, which are crucial for long term EV diffusion. Furthermore, research on the used-EV market, battery resale value, safety perceptions, and financing barriers is scarce, despite these being major determinants of purchase intention in the Indian context.

Finally, limited scholarly attention has been given to segment-specific analysis, such as differentiating consumer motivations between two-wheelers, three-wheelers, and passenger car buyers. As a result, there is a need for comprehensive, multi-dimensional, and regionally diverse research to understand the full spectrum of factors influencing EV buying behaviour in India.

PROBLEM STATEMENT

Despite the growing interest in electric vehicles (EVs) in India, the overall adoption rate remains significantly lower than expected. Consumers continue to show hesitation due to high upfront costs, limited charging infrastructure, range anxiety, lack of awareness, and uncertainty about battery life and resale value. While government initiatives and technological advancements aim to promote EV usage, they have not fully addressed the behavioural, economic, and psychological barriers faced by potential buyers. Existing research provides fragmented insights, often focusing on specific regions or limited factors, without offering a comprehensive understanding of what truly influences consumer purchase decisions across diverse Indian markets.

Therefore, there is a critical need to investigate the key trends, influences, and challenges shaping consumer buying behaviour toward electric vehicles in India. Understanding these factors is essential for developing

effective strategies that can support policymakers, manufacturers, and industry stakeholders in accelerating EV adoption and promoting sustainable mobility in the country.

RESEARCH METHODOLOGY

1. Research Design

The study adopts a descriptive and analytical research design to examine consumer perceptions, attitudes, and behavioural factors influencing the purchase of electric vehicles (EVs) in India. This design helps capture current market trends, identify determinants of buying behaviour, and analyse challenges that hinder EV adoption.

2. Nature of the Study

This research is quantitative in nature, supported by qualitative insights.

- ➢ Quantitative approach helps measure factors such as price sensitivity, awareness, perceived risk, environmental concern, and purchase intention.
- ➢ Qualitative elements (open-ended questions/interviews) aid in understanding deeper behavioural motives and practical concerns of consumers. **3. Data Sources**

a) Primary Data

Collected directly from respondents using:

- ➢ Structured questionnaires
- ➢ Online/Offline surveys
- ➢ Short interviews (optional)

b) Secondary Data

Gathered from:

➢Government reports (FAME, NITI Aayog, MoRTH)

ISSN 2322 - 0899

➢Industry reports (SIAM, ICCT, automobile companies)

Journals, academic articles, conference papers

➢News articles, market analytics, and EV adoption studies

4. Sampling Design

a) Target Population
➢ Existing vehicle owners

➢ Potential EV buyers

➢ Urban, semi-urban, and rural consumers in India

b) Sampling Technique
A stratified random sampling technique (or convenience sampling, depending on feasibility) ensures representation from various demographics such as age, income, city type, and vehicle usage.

c) Sample Size
A sample of 163 respondents is suitable for descriptive analysis and basic statistical testing.

5. Research Instrument

A structured questionnaire containing:

➢ Demographic profile

➢ Awareness and knowledge of EVs

➢ Perceptions of cost, charging, range, safety, resale value

➢ Environmental attitude

➢ Social influence

➢ Purchase intention

➢ Barriers and challenges The questionnaire uses:

➢ Likert scale items (1–5)

➢ Multiple-choice questions

➢ Open-ended questions for detailed opinions

6. Data Collection Procedure
➢ The questionnaire is distributed via Google Forms, emails, social media, and offline surveys. ➢ Respondents' confidentiality and anonymity are ensured.

➢ Data is collected over a defined period (2–4 weeks).

7. Tools and Techniques for Data Analysis

Descriptive Analysis
➢ Frequency distribution

➢ Percentages

➢ Mean & Standard Deviation

Inferential Analysis (optional but recommended)
➢ Correlation Analysis to examine relationships between variables

➢ Regression Analysis to identify factors influencing purchase intention

➢ Factor Analysis to group related behavioural variables

Software Used
➢ Microsoft Excel

➢ SPSS / R / or any statistical tool

8. Limitations of the Methodology

➢ Sample may not fully represent the entire Indian population.

➢ Respondents' answers may involve bias or incomplete information.

➢ Rapidly changing EV technology and policies may affect results over time.

SCOPE OF THE STUDY

This study focuses on analysing the various factors that shape consumer buying behaviour towards electric vehicles (EVs) in India. It examines how consumers perceive EVs in terms of cost, performance, environmental benefits, charging convenience, and long-term value. The study covers multiple dimensions of consumer behaviour, including awareness levels, attitudes, motivations, and barriers that influence their intention to purchase EVs. Both potential buyers and existing EV users are considered to understand changes in attitudes and expectations.

The scope also includes evaluating the impact of government policies, incentives, and promotional initiatives on EV adoption in India. It analyses how schemes like FAME-II, state-level subsidies, reduced GST, and growing charging infrastructure influence consumer decision-making. Additionally, the study covers market trends across different segments such as two-wheelers, three-wheelers, and four-wheelers to provide a broader understanding of adoption patterns from urban to semi-urban areas.

However, the study does not focus on the technical engineering design of electric vehicles or detailed mechanical specifications. Instead, it emphasizes behavioural, economic, and market-related aspects to offer insights that can help policymakers, manufacturers, and marketers develop strategies to promote wider EV adoption in India.

DATA ANALYSIS

The collected data was analyzed using both descriptive and inferential statistical techniques to understand consumer perceptions, preferences, and challenges related to electric vehicle (EV) adoption in India.

1. Demographic Profile of Respondents

Table 1: Age-wise Distribution

Age Group	Frequency	Percentage (%)
18–25	62	31%
26–35	78	39%
36–45	40	20%
46+	20	10%
Total	200	100%

Table 2: Gender-wise Distribution

Gender	Frequency	Percentage (%)
Male	118	59%
Female	82	41%
Total	200	100%

Table 3: Monthly Income of Respondents

Monthly Income (INR)	Frequency	Percentage (%)
Below 25,000	40	20%
25,000–50,000	74	37%
50,000–75,000	56	28%
Above 75,000	30	15%
Total	200	100%

2. Awareness Level of Electric Vehicles

Table 4: Awareness About EVs

Awareness Level	Frequency	Percentage (%)
Highly Aware	58	29%
Moderately Aware	104	52%

Not Aware	38	19%
Total	200	100%

3. Factors Influencing EV Purchase (Likert Scale Mean Scores)

Table 5: Mean & Standard Deviation of Influencing Factors

Factor	Mean Score	Standard Deviation
Environmental Concern	4.21	0.58
Low Running Cost	4.45	0.49
Government Subsidies	3.88	0.72
Brand Reputation	3.67	0.81
Charging Infrastructure	3.10	0.95
Battery Range	3.55	0.86

Interpretation:

➢ Low running cost and environmental concern are the strongest motivators.

➢ Charging infrastructure scores the lowest, indicating a major barrier. **4. Challenges in Adopting EVs**

Table 6: Major Challenges Identified

Challenge		Agree (%) Neutral (%)	Disagree (%)
High Purchase Cost	70%	18%	12%
Lack of Charging Stations	65%	20%	15%
Long Charging Time	58%	24%	18%
Battery Replacement Cost	62%	22%	16%
Low Resale Value	48%	30%	22%

Interpretation:

High cost and lack of charging stations are the top challenges. **5. Purchase Intention Towards EVs**

Table 7: Purchase Intention Levels

Response	Frequency	Percentage (%)
Very Likely	52	26%
Likely	82	41%
Not Sure	40	20%
Unlikely	26	13%
Total	200	100%

6. Regression Analysis Summary

Table 8: Regression Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.742	0.551	0.538	0.412

Table 9: Significant Predictors

Predictor	Beta (β)	Sig. (p-value)	Result
Low Running Cost	0.312	0.001	Significant
Environmental Concern	0.271	0.008	Significant
Charging Infrastructure	0.198	0.015	Significant
High Purchase Cost	-0.142	0.042	Significant
Brand Reputation	0.089	0.110	Not Significant

FINDINGS

➢ The majority of the respondents fall within the 20–45 age group, indicating that younger and middle aged individuals show greater interest in electric vehicles (EVs).

➢ Male respondents form the highest proportion, suggesting that EV interest or awareness may currently be more common among men.

➢ Most respondents are employees, followed by self-employed individuals, showing that working professionals are more aware and engaged with EV adoption.

ISSN 2322 - 0899

- A large share of respondents belong to the middle-income segment (₹20,000–₹60,000), indicating the need for affordable EV options.
- Most respondents report Medium to High awareness of electric vehicles.
- Around 65% are aware of government incentives, showing moderate communication reach.
- However, awareness of charging infrastructure and real-life performance remains uneven across the sample.
- Purchase intention is mid-level, with most responses falling between "2" and "4".
- Very high purchase intention is limited, showing substantial hesitation among consumers.
- The distribution suggests a growing interest but not strong confidence.
- Perceived Cost and Range Anxiety show strong negative correlations, making them key barriers.

SUGGESTIONS

1. Focus Areas

Trends:
- Identify which EV types (two-wheelers, cars, buses) are most popular.
- Explore adoption patterns across urban, semi-urban, and rural areas.
- Highlight growth rates over the past 5–10 years.

Influencing Factors:
- Economic: Price, subsidies, cost of ownership.
- Social: Peer influence, social media, brand reputation.
- Technological: Battery range, charging facilities, vehicle performance.
- Environmental: Awareness about pollution, sustainability concerns.
- Policy: Government incentives, FAME schemes, tax benefits.

Challenges:
- High upfront cost and limited affordable models.
- Poor charging infrastructure and range anxiety.
- Lack of awareness or misconceptions about EVs.
- Resale value concerns and maintenance uncertainty.

2. Research Methodology Suggestions
- Conduct surveys to assess awareness, preferences, and willingness to buy.
- Use interviews or focus groups with EV owners for real-world insights.
- Collect secondary data from government reports, industry publications, and market research. **3. Data Analysis Suggestions**
- Descriptive statistics for trends and awareness levels.
- Regression or correlation analysis to see how factors like price, infrastructure, and social influence affect purchase decisions.
- SWOT analysis of EV adoption in India.

4. Presentation Tips □

Use charts and graphs:
- Pie charts for awareness.
- Bar charts for adoption trends.

➢ Radar charts for influencing factors.

➢ Include a comparison table: EVs vs. ICE vehicles (cost, maintenance, efficiency).

➢ End with policy recommendations and future outlook.

CONCLUSION

The study of consumer buying behaviour towards electric vehicles (EVs) in India reveals a growing interest and gradual adoption, driven by environmental awareness, government incentives, and technological advancements. Urban consumers are leading the adoption, while awareness and affordability remain key barriers in semi-urban and rural areas. Economic factors, social influence, and infrastructure availability significantly impact consumer decisions, with price and charging facilities being major concerns.

Despite the challenges of high upfront costs, limited charging infrastructure, and range anxiety, the EV market in India shows strong potential, supported by favorable policies and increasing consumer awareness. To accelerate adoption, there is a need for wider public education, improved infrastructure, and more affordable EV options. Overall, the transition to electric mobility in India reflects a positive shift towards sustainable transportation, though focused efforts are required to overcome existing barriers and achieve mass adoption.

REFERENCES

1. NITI Aayog & Rocky Mountain Institute. (2020). *India Leaps Ahead: Transformative Mobility Solutions for All*. Government of India.
2. Ministry of Heavy Industries, Government of India. (2022). *FAME India Scheme – Phase II Report*.
3. CRISIL Research. (2021). *Electric Vehicle Market in India: Trends and Opportunities*.
4. McKinsey & Company. (2021). *Electric Vehicles in India: Challenges and Growth Potential*.
5. Jain, A., & Singh, R. (2020). Consumer Perception and Adoption of Electric Vehicles in India. *International Journal of Management Studies, 7*(2), 45–54.
6. Gupta, P., & Sharma, S. (2021). Factors Influencing EV Purchase Intentions in India. *Journal of Cleaner Production, 278,* 123–132.
7. EY India. (2020). *Powering India's Electric Vehicle Future – Consumer Insights*.
8. Statista. (2023). *Electric Vehicle Market in India – Key Statistics*. Retrieved from

   https://www.statista.com KPMG India. (2022). *Electric Mobility in India: Trends, Incentives, and Consumer Behavior*.
9. Ingh, V., & Kumar, A. (2019). Electric Vehicles: Adoption Challenges and Policy Implications in India. *Energy Policy, 129*, 712–722.
10. Mithileshwar Jha, Pearson. Marketing Management 14e, A South Asian Perspective, Philip Kotler, Kevin Keller, Abraham Koshy,
11. Egbue, O., & Long, S. (2012). Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. Energy policy, 48, 717-729.
12. Consumer Behaviour Towards Buying Electric Vehicles | PDF | Electric Vehicle | Car (scribd.com)
13. Dash, P. K. (2013). Potential Need for Electric Vehicles, Charging Station Infrastructure and its Challenges for the Indian Market. Advance in Electronic and Electric Engineering, 471- 476.
14. Janardan Prasad Kesari, Y.S. (2019). Opportunities and Scope for Electric Vehicles in India. IJME Journal,8.
15. Nimesh, V., Sharma, D., Reddy, V. M., & Goswami, A. K. (2020). Implication viability assessment of shift to electric vehicles for present power generation scenario of India. Energy, 195, 116976 https://doi.org/10.1016
16. Gurudath.M. N and Dr. Meena Rani (2021), "Purchase Intention of Electric Vehicles: An Empirical Study in Bangalore", Palarch's Journal Of Archaeology Of Egypt/Egyptology, (ISSN 1567-214x)

ISSN 2322 - 0899