Impact Factor (SJIF): 6.126 E-ISSN: 2583-1615, P-ISSN: 3049-3498

International Journal of Research in Academic World

Received: 29/August/2025 **IJRAW:** 2025; 4(10):587-599 **Accepted:** 10/October/2025

A Study on the Factors Influencing Consumer Buying Behavior towards Electric Scooters in Ammapettai, Erode District

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Abstract

The adoption of electric vehicles (EVs) in India is accelerating due to rising environmental concerns, technological advancements, and supportive government policies. Electric two-wheelers, particularly scooters, dominate this growth because of their affordability, low operating costs, and suitability for short urban and semi-urban commutes. This study examines consumer buying behavior towards electric scooters in Ammapettai, a semi-urban town in Erode district, Tamil Nadu, focusing on factors influencing adoption and barriers faced by potential buyers. A descriptive and explanatory research design was employed, collecting primary data from 50 respondents using structured questionnaires. Secondary data from government reports, academic studies, and industry publications supplemented the analysis. Quantitative data were analyzed using descriptive statistics and mean scores, while qualitative insights from open-ended responses highlighted consumer perceptions, preferences, and challenges. Findings indicate that affordability, fuel savings, environmental awareness, and government incentives are primary motivators, whereas high initial costs, limited charging infrastructure, battery concerns, and doubts about resale value hinder adoption. Most users expressed satisfaction and a willingness to recommend electric scooters, emphasizing the influence of word-of-mouth on adoption. The study concludes that enhancing charging facilities, creating awareness programs, providing attractive incentives, and ensuring reliable after-sales services are crucial for promoting electric scooter adoption in semi-urban areas, supporting India's transition towards sustainable mobility.

Keywords: Electric Scooters, Consumer Buying Behavior, Semi-Urban Adoption, Charging Infrastructure, Environmental Awareness, EV Adoption Barriers.

1. Introduction

i). Background of the Study:

India's electric vehicle (EV) revolution is gaining strong momentum, driven by environmental concerns, technological advancements, and progressive government initiatives. With increasing levels of air pollution and growing global emphasis on sustainable development, the Indian government has launched several measures such as the FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) schemes, tax benefits, and state-level subsidies[1] to promote the use of electric mobility. Improvements in lithium-ion battery technology, enhanced driving ranges, and the development of charging infrastructure, coupled with rising fuel prices, have further accelerated consumer interest in electric vehicles. Among various categories, the two-wheeler segment has emerged as the leading contributor to India's EV adoption due to its affordability, low operating costs, and convenience for short urban commutes. Supported by the FAME-II scheme and state incentives, electric scooters now account for nearly 70–75% of total EV sales in India[2], signifying a major transformation in the nation's transportation landscape.

In Tamil Nadu, the shift towards electric mobility has been particularly noteworthy. The state's Electric Vehicles Policy 2023[3] aims to position Tamil Nadu as a leading hub for EV manufacturing and adoption by offering capital subsidies for industries, road tax and registration fee exemptions for consumers, and incentives for developing public charging and battery-swapping networks. These initiatives have attracted industrial investments and simultaneously encouraged individuals and small businesses to adopt electric vehicles for daily commuting and local transportation needs. The electric two-wheeler market in Tamil Nadu is experiencing rapid growth, with significant sales recorded in cities like Chennai, Coimbatore, and Tiruppur. In Ammapettai, a semi-urban town in Erode district, the adoption of electric two-wheelers is steadily rising as consumers become more environmentally aware and cost-conscious. Increasing fuel prices, government incentives, and growing interest in sustainability have encouraged residents, especially small business owners,

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students, and middle-income families to choose e-scooters as a practical, economical, and eco-friendly mode of transport.
However, several factors influence customer buying behavior towards e-scooters in Ammapettai, including price, performance, design, brand trust, government incentives, charging convenience, and environmental awareness. Understanding these factors is essential to assess consumer attitudes and purchasing patterns in semi-urban contexts.
As Tamil Nadu continues to enhance its EV infrastructure and awareness initiatives, analyzing the determinants of customer behavior in regions like Ammapettai will provide valuable insights for manufacturers, policymakers, and marketers. Such an understanding will help in formulating effective marketing strategies, improving policy implementation, and promoting a smoother transition towards sustainable and eco-friendly mobility in the region.[4]

ii). Rationale of the Study:
The transition towards electric mobility is one of the most significant developments in India's transportation sector, aligning with global efforts to reduce carbon emissions and promote environmental sustainability. While much of the focus on electric vehicle (EV) adoption has been on urban centers, semi-urban regions like Ammapettai in Tamil Nadu represent a crucial yet underexplored market segment. These areas serve as vital links between rural and urban economies, where affordability, practicality, and accessibility play a major role in shaping consumer preferences.
In semi-urban Tamil Nadu, consumers are becoming increasingly aware of the economic and environmental advantages of electric two-wheelers. However, their buying behavior is influenced by a complex mix of factors such as price sensitivity, income level, charging convenience, brand perception, performance reliability, and awareness of government incentives. Studying these factors in a semi-urban context is essential, as the motivations, constraints, and decision-making patterns of consumers in towns like Ammapettai differ significantly from those in metropolitan cities.
This study is important because it bridges the knowledge gap between policy intentions and ground-level adoption behavior. Tamil Nadu's Electric Vehicles Policy 2023 provides strong institutional support for EV manufacturing and adoption, but its effectiveness largely depends on consumer acceptance in smaller towns and developing regions. Understanding how residents of Ammapettai perceive, evaluate, and decide to purchase e-scooters will help policymakers and manufacturers identify practical barriers to adoption such as lack of charging infrastructure or insufficient awareness and design strategies to overcome them.
Furthermore, insights from this study can guide local dealerships, marketers, and EV companies in developing targeted approaches that cater to the needs of semi-urban consumers, ensuring affordability, trust, and convenience. By focusing on Ammapettai, this research contributes to the broader understanding of how India's EV revolution can reach beyond cities and foster sustainable mobility at the grassroots level, making Tamil Nadu a model for inclusive and balanced electric vehicle adoption.

iii). Scope and Significance of the Research:
Scope of the Study: The scope of this study is twofold. First, it seeks to identify and analyze the key factors influencing customer buying behavior towards e-scooters in Ammapettai, a semi-urban town in Erode district. These factors include price, performance, design, brand perception, government incentives, charging convenience, and environmental awareness. Second, the study examines how these factors shape consumer decision-making patterns and preferences, providing insights into the adoption of electric mobility in semi-urban areas.

Significance of the Study:
The significance of this research lies in its potential to:
i). Provide empirical evidence on the determinants of e-scooter purchase decisions among semi-urban consumers.
ii). Offer practical recommendations to manufacturers, marketers, and dealerships to design strategies that address the specific needs of semi-urban buyers.
iii). Assist policymakers in evaluating the effectiveness of EV incentives like and identifying barriers to adoption in semi-urban contexts.[5]
iv). Contribute to academic discourse by bridging the gap between consumer behavior theory and practical adoption of sustainable transport solutions.

Ultimately, this research highlights that understanding customer preferences in semi-urban areas is essential for promoting sustainable and inclusive electric mobility, ensuring that the EV revolution reaches beyond urban centers and benefits smaller towns like Ammapettai.

2. Review of Literature

i). Consumer Perception of Electric Vehicles: Global and national studies indicate that consumer perception plays a crucial role in the adoption of electric vehicles (EVs). International research[6] highlights factors such as perceived reliability, brand reputation, convenience, and social influence as significant determinants of adoption. In India, two-wheeler buyers generally view EVs as environmentally friendly, cost-effective, and suitable for short-distance commuting, though concerns about performance, battery life, and charging infrastructure influence their perception.[7]

ii). Price Sensitivity and Technology Acceptance: Price remains a key factor affecting EV adoption, especially in semi-urban and rural regions. High upfront costs can deter potential buyers despite long-term savings on fuel and maintenance. Studies indicate that affordability and operating cost savings are major motivators for electric two-wheeler adoption in semi-urban and urban areas.[8] Additionally, technology acceptance factors, such as perceived usefulness and ease of use, also influence purchase decisions.[9] Government incentives, including FAME-II subsidies, tax exemptions, and state-level policies, have been shown to enhance adoption among cost-sensitive and middle-income consumers.[10]

iii). Environmental and Psychological Factors: Environmental awareness is another important driver for EV adoption. Consumers increasingly prefer eco-friendly vehicles to reduce carbon emissions and urban pollution.[11] Studies using the Theory of Planned Behaviour[12] show that attitudes toward sustainability, subjective norms, and perceived behavioural control significantly impact the intention to adopt EVs, particularly among younger and environmentally conscious consumers. Social influence and peer behaviour also contribute to adoption in semi-urban contexts.

iv). EV Adoption in India and Tamil Nadu: Two-wheelers

dominate India's EV market, accounting for nearly 70–75% of total EV sales, with urban centres like Bangalore, Chennai, and Pune leading adoption.[13] In Tamil Nadu, government initiatives such as the Electric Vehicles Policy 2023 provide capital subsidies, tax incentives, and support for public charging infrastructure, encouraging both urban and semi-urban adoption.[14] Semi-urban towns, however, experience slower growth due to limited infrastructure, lower awareness, and socio-economic constraints.[15]

v). **Barriers to EV Adoption:** Despite supportive policies, several challenges persist. Studies highlight insufficient charging stations, limited battery range, and socio-economic limitations as significant barriers to EV adoption in semi-urban regions.[16]Additionally, emerging safety concerns, such as battery fires or overheating when parked in sunlight, can create hesitation among potential buyers. Addressing both infrastructural and safety-related issues is crucial for enhancing EV adoption in semi-urban regions. Understanding these barriers is critical for enhancing adoption and tailoring marketing strategies to local needs.

vi). **Research Gap:** While several studies address national and urban-level EV adoption, there is limited research at the micro-level in semi-urban towns like Ammapettai, Erode district. Few studies investigate how local consumer behavior, price sensitivity, environmental awareness, and infrastructural limitations interact to influence e-scooter adoption. Understanding these factors in smaller towns is essential for policymakers, manufacturers, and marketers to design targeted strategies that promote sustainable mobility beyond metropolitan areas.

3. Research Methodology

3.1. Objectives of the Study:

The primary objectives of this study are:

i). To analyze consumer perception of electric vehicles (EVs) in Erode

ii). To examine the factors influencing EV adoption among consumers

iii). To explore environmental and social awareness among potential EV buyers

iv). To identify barriers and challenges faced by consumers in adopting EVs

v). To offer practical suggestions to manufacturers and policymakers for promoting electric vehicle (EV) adoption in semi-urban areas.

3.2. Statement of Problem:

EV adoption in semi-urban areas like Ammapettai remains low due to high initial costs, inadequate charging infrastructure, and limited consumer awareness. While metropolitan areas show gradual acceptance because of better infrastructure and outreach, semi-urban consumers continue to face hesitation and uncertainty regarding EV ownership. Most existing research focuses on urban populations, leaving a gap in understanding perceptions, motivators, and barriers among semi-urban consumers. This study addresses this gap by examining consumer perception, adoption factors, and challenges in Erode, with the goal of proposing actionable measures to improve acceptance.

3.3. Research Hypotheses

Based on the objectives, the study proposes the following hypotheses:

H_1: There exists a significant relationship between consumer perception and the adoption of electric vehicles (EVs) in semi-urban areas.

H_2: Barriers such as high initial cost, long charging time, and limited charging infrastructure have a significant negative impact on the adoption of electric vehicles.

H_3: Environmental awareness and technological understanding positively influence the acceptance and adoption of electric vehicles in semi-urban regions.

H_4: Socio-economic factors, including income level, occupation, and education, significantly affect consumers' willingness to adopt electric vehicles.

H_5: Government initiatives, such as subsidies, incentives, and awareness programs, significantly influence the adoption of electric vehicles in semi-urban areas.

3.4. Research Design:

This study adopts a descriptive and explanatory research design, employing a primarily quantitative approach with elements of qualitative insights to examine consumer perception and adoption of electric vehicles (EVs) in semi-urban areas like Erode. The descriptive component captures current patterns of consumer awareness, perception, and adoption behaviors, while the explanatory component investigates the influence of factors such as socio-economic variables, environmental awareness, technological understanding, safety concerns, and government initiatives on consumers' willingness to adopt EVs. Structured questionnaires will be used to collect data, enabling statistical analysis of relationships between these variables. This integrated approach provides a comprehensive understanding of both measurable adoption trends and the underlying determinants shaping consumer decisions in a semi-urban context.

3.5. Population and Sample Selection:

The target population for this study comprises residents of semi-urban areas in and around Ammapettai in Erode who are potential or existing electric vehicle (EV) users. These individuals are considered relevant for the study as they are either aware of or have considered purchasing an EV, making their perceptions and adoption behaviors valuable for analysis. A sample of approximately 50 respondents will be selected from this population. The study will employ convenience or purposive sampling, focusing on individuals who meet the criteria of awareness or consideration of EVs. This approach ensures that the collected data is relevant and provides meaningful insights into consumer perception, barriers, and adoption patterns in the semi-urban context.

3.6. Tools of Data Collection

The study uses primary and secondary data sources:

Primary data will be collected through structured questionnaires distributed to selected respondents, capturing information on their awareness, perceptions, adoption behavior, barriers, and attitudes toward EVs.

Secondary data will be gathered from academic articles, government reports, policy documents, and previous studies on EV adoption in India and globally.

The combination of primary and secondary data enables a robust analysis of both empirical findings and existing knowledge, facilitating well-informed conclusions and recommendations.

3.7. Research Instrument

The primary instrument utilized for this study was a Google Form-based structured questionnaire designed to gather information on consumer perceptions, usage patterns, and adoption behaviors concerning electric scooters. The questionnaire can be accessed here: https://docs.google.com/forms/d/e/1FAIpQLSdhdbC6xEpHjVC67HWQ8ODbBCwztMwS_jXCbCnAzcxIaMrJpg/viewform?usp=preview.

Additionally, informal oral interactions and interviews were conducted with select participants to gain deeper insights into their experiences, challenges, and preferences regarding electric scooter usage. These combined instruments facilitated the collection of both quantitative and qualitative data, offering a comprehensive understanding of the factors influencing EV adoption.

3.8. Questionnaire Sections

Section A: Personal Information

i). Name:

ii). Age Group:
- 18–25
- 26–35
- 36–45
- 46–55
- 56+

iii). Gender:
- Male
- Female
- Others

iv). Educational Qualification:
- Below 12th standard
- 12th standard
- Diploma/Graduate
- Postgraduate and above

v). Occupation:
- Student
- Salaried (Private)
- Government Employee
- Self-Employed/Business
- Others:_

vi). Monthly Income:
- Below ₹20,000
- ₹20,001 – ₹40,000
- ₹40,001 – ₹60,000
- ₹60,001 – ₹80,000
- Above ₹80,000

vii). Area of Residence:
- Urban
- Sub-urban/Town
- Rural

Section B: Vehicle Ownership & Information Sources

i). Current Vehicle Ownership (Select all that apply):
- Petrol bike/scooter
- Electric bike/scooter
- Car (Petrol/Diesel)
- Electric car
- None

ii). Source of Most Useful Information Before Purchase:
- Dealer/Showroom Staff
- Friends/Family
- Online Reviews/Forums
- Advertising
- Test Rides

Section C: Pre-Purchase Concerns & Consideration

i). Main Concerns Before Purchasing an Electric Scooter (Select Top 3):
- High initial cost
- Limited driving range per charge
- Lack of charging stations near my area
- Long charging time
- Concerns about battery life
- High battery replacement cost
- Lack of service centers/spare parts
- Doubts about resale value
- Limited model/design options
- Poor performance compared to petrol bikes
- Other:_

ii). Time Taken to Consider Purchase:
- Less than 1 month
- 1–3 months
- 3–6 months
- More than 6 months

iii). Purchase Timeline:
- Less than 6 months ago
- 6–12 months ago
- 1–2 years ago
- More than 2 years ago

iv). Awareness of Government Subsidies/Incentives:
- Yes, and I availed it
- Yes, but I didn't avail it
- No

v). Financing Method:
- Full payment (cash/online)
- Bank loan/EMI
- Other:_

Section D: Purchase Motivation & Usage

i). Primary Reason for Purchasing an Electric Scooter:
- Price
- Fuel cost savings
- Environmental concerns
- Government subsidies
- Advanced features/Technology
- Style & design
- Other:_

ii). Primary Purpose of Using Electric Scooter:
- Office/College Commute
- Leisure/Short Trips
- Delivery/Business Use
- Other:_

iii). Frequency of Use:
- Daily
- 4–6 days a week
- 1–3 days a week
- Rarely

iv). Difficulty in Finding Charging Points:
- Yes
- No

Section E: Perception & Satisfaction (5-Point Likert Scale)
Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree

a) Electric bikes are a cost-effective alternative to petrol bikes.
b) Electric bikes are suitable for long-distance travel.
c) Electric bikes are eco-friendly.
d) Maintenance cost is lower compared to petrol bikes.
e) Charging infrastructure is sufficient in my area.

Section F: Post-Purchase Experience

i). Major Issues Faced After Purchase:
- Yes → Please specify:
- No

ii). Satisfaction with Electric Bike Performance:
- Very Satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very Dissatisfied

iii). Recommendation to Others:
- Yes
- No

Biggest Improvement Desired in Current Electric Bike:_

3.9. Data Analysis Techniques

The data collected from the questionnaire were analyzed using the Mean Method, which helped to identify common patterns, perceptions, and attitudes toward electric scooter usage, adoption behavior, and satisfaction levels. Quantitative data were further analyzed using statistical techniques such as descriptive statistics and cross-tabulation to examine relationships between demographic factors, purchase motivations, usage patterns, and satisfaction. Qualitative data from open-ended responses and oral interactions were analyzed using thematic analysis, identifying recurring patterns, perceptions, challenges, and suggestions regarding electric scooter usage. The integration of both quantitative and qualitative analyses provided a comprehensive and triangulated understanding of consumer behavior and factors influencing electric vehicle adoption.

3.10. Limitations of the Study

While the study aims to provide robust insights, certain limitations are acknowledged:

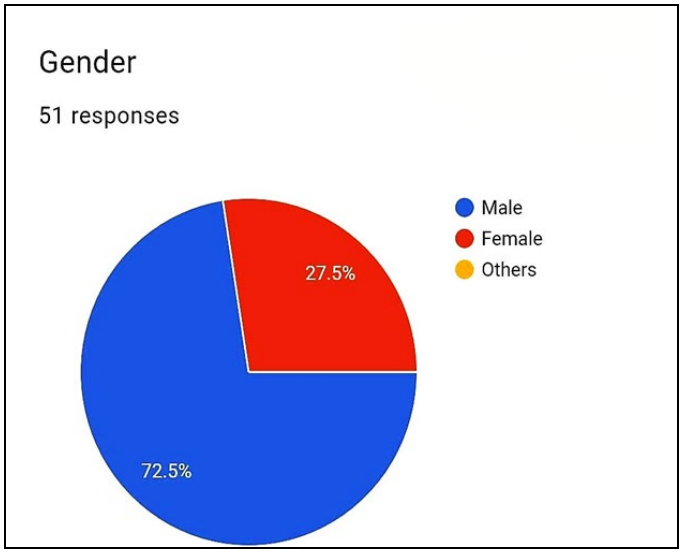
i). The sample is limited to selected respondents in a specific region and may not represent all electric scooter users across different cities or rural areas.
ii). Responses may be subject to self-reporting bias, as participants may overstate positive experiences or underreport challenges with electric scooters.
iii). Socio-economic and infrastructural differences across regions may influence the generalizability of the findings.
iv). Time constraints and limited access to diverse user groups may restrict the depth and variety of data collected.

Despite these limitations, the study is expected to provide valuable empirical and practical insights into consumer perceptions, usage patterns, and factors influencing the adoption of electric scooters.

4. Data Analysis and Interpretation

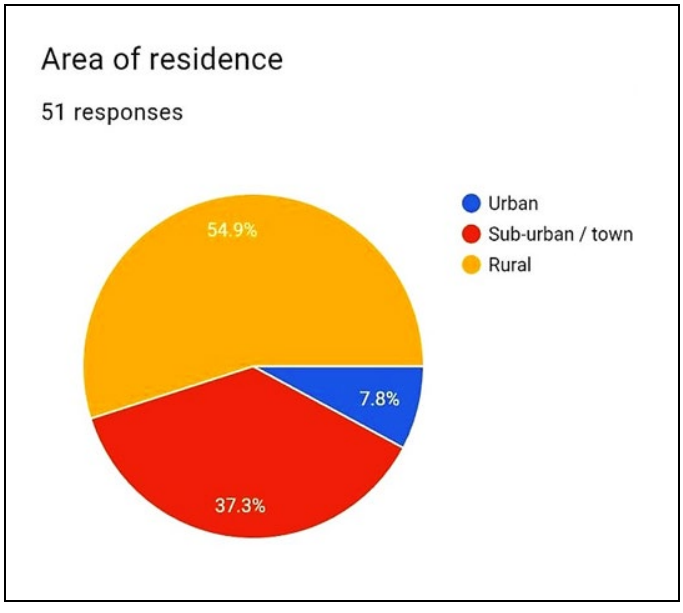
4.1. Demographic Profile of Respondents:

i). Gender Distribution:



Inference: The demographic analysis of the respondents indicates that a significant majority are male (72.5%), while females constitute 27.5%, and no respondents identified as "Others." This suggests that electric scooter usage or adoption in the surveyed area is predominantly male.

ii). Area of Residence:

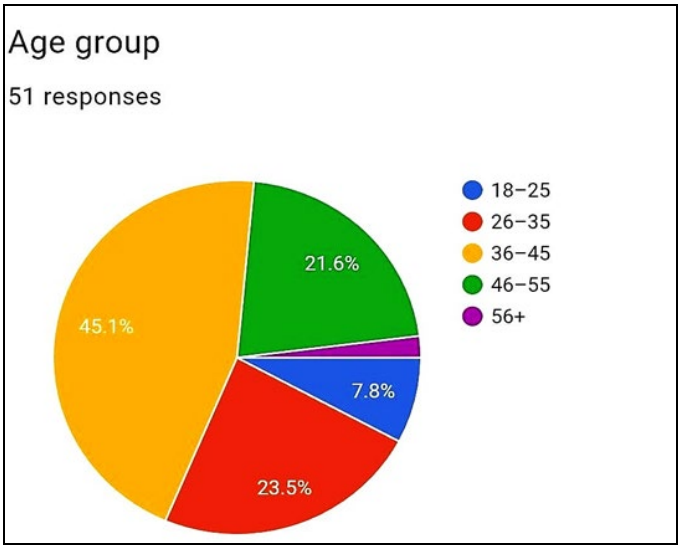


- **Rural respondents:** 54.9%

- **Sub-urban/town respondents:** 37.3%
- **Urban respondents:** 7.8%

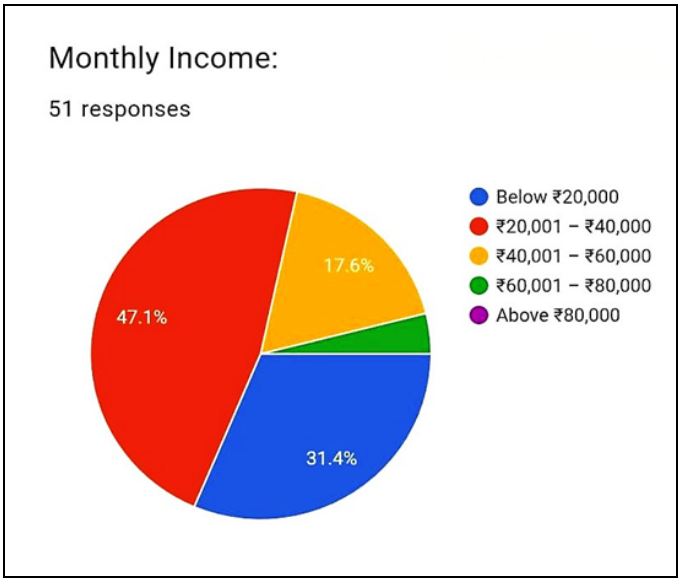
Inference: This implies that electric scooters are increasingly being adopted in non-urban regions, which may reflect affordability, commuting needs, or local transport preferences.

iii). Age Distribution:



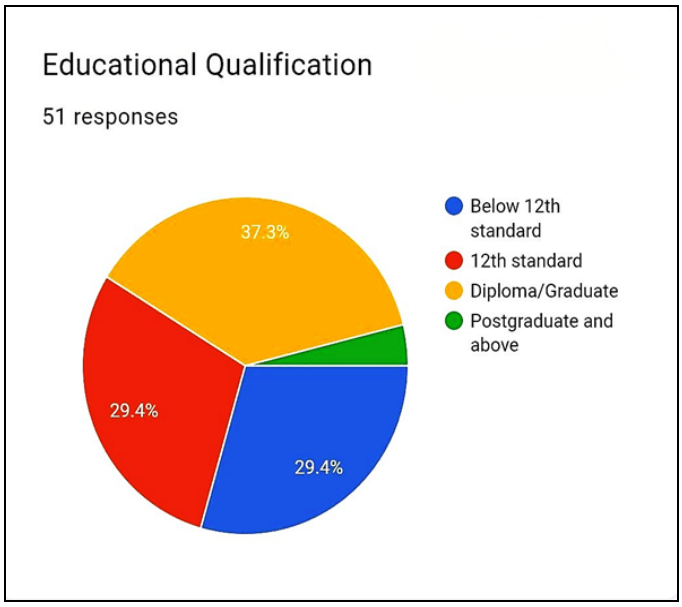
Inference: The age distribution shows that the largest group of respondents falls within the 36– 45 years category (45.1%), followed by 26–35 years (23.5%) and 46–55 years (21.6%). The younger age group (18–25 years) and older adults (56+) represent smaller percentages at 7.8% and 2.0% respectively. This indicates that middle-aged adults are the primary users or decision-makers when it comes to purchasing electric scooters.

iv). Monthly Income:



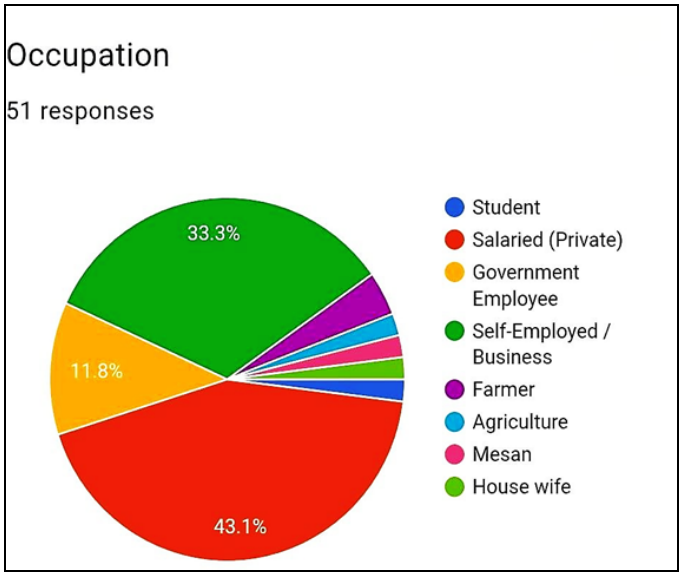
Inference: Nearly half of the respondents (47.1%) earn ₹20,001–₹40,000, followed by those earning below ₹20,000 (31.4%) and ₹40,001–₹60,000 (17.6%). Very few respondents fall into higher income brackets. This suggests that electric scooters are largely adopted by low to middle-income groups, highlighting the importance of affordability and cost-effectiveness in purchase decisions.

v). Educational Qualification:



Inference: The educational qualification profile shows that the majority of respondents are Diploma/Graduate holders (37.3%), with nearly equal proportions of below 12th standard (29.4%) and 12th standard (29.4%). Only a small fraction (3.9%) hold postgraduate qualifications. This indicates that the adoption of electric scooters is primarily among moderately educated individuals.

vi). Occupation:



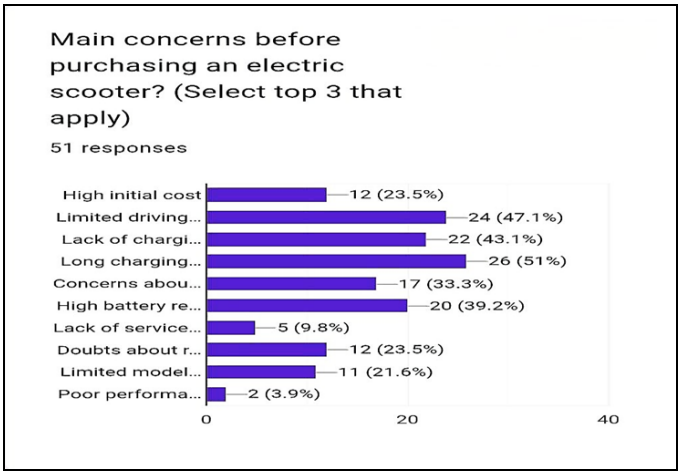
Inference: Most respondents are salaried employees in private jobs (43.1%) or self-employed/business owners (33.3%), while government employees account for 11.8%. The remaining occupations, including students, farmers, housewives, and others, make up around 11.8%. This suggests that individuals with regular commuting needs or business-related mobility are the main users of electric scooters.

Overall, the typical respondent is a middle-aged male, residing in rural or semi-urban areas, earning ₹20,001–₹40,000 per month, holding a Diploma/Graduate qualification, and employed in private or self-owned business,

indicating the primary target group for electric scooter adoption in the surveyed region.

4.2. Factors Influencing Purchase Decision:

i). Major Concerns before Purchase:

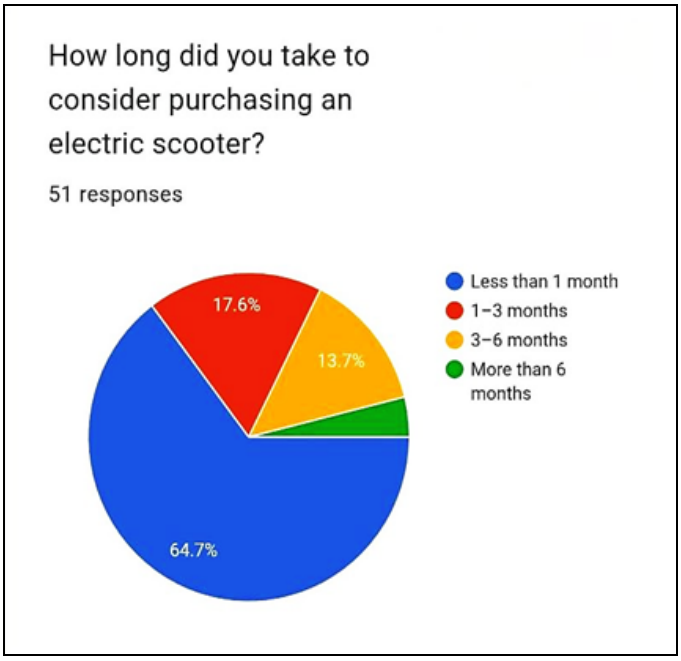


Inference: The top concerns identified were:

- Long charging time (51%)
- Limited driving range (47.1%)
- Lack of charging infrastructure (43.1%)
- High battery replacement cost (39.2%)
- Other issues such as safety/reliability (33.3%), high initial cost (23.5%), and resale value doubts (23.5%) were also significant.

This shows that battery efficiency, charging infrastructure, and cost-related issues remain major barriers to purchase, indicating the need for technological improvements and government-backed infrastructure development.

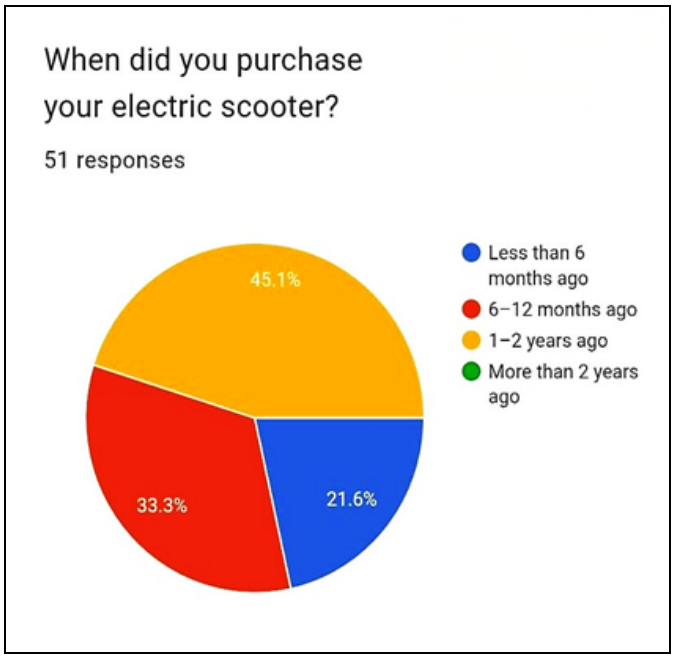
ii). Duration of Consideration before Purchase:



Inference: A significant 64.7% of consumers made their purchase decision within one month, while 17.6% took 1–3 months, and 13.7% considered 3–6 months. Only a small portion (4%) deliberated for over 6 months.

This reveals that most buyers are impulsive or quick decision-makers, possibly influenced by peer recommendations, immediate financial benefits, or increasing trust in EV technology.

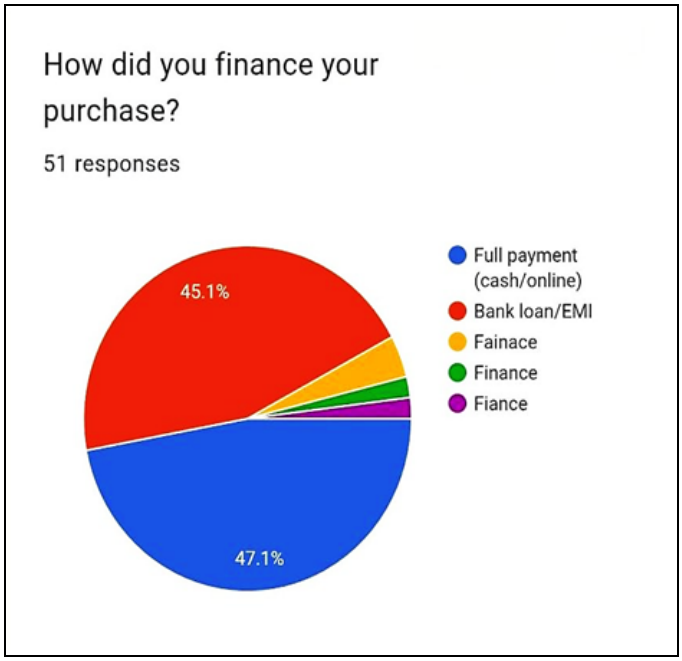
iii). Time of Purchase:



Inference: A majority of respondents (45.1%) purchased their electric scooters 1–2 years ago, followed by 33.3% who made their purchase within the last 6–12 months. Only 21.6% are recent buyers (less than 6 months), while none reported ownership beyond 2 years.

This indicates that electric scooter adoption in the surveyed area is a recent trend, showing a steady growth in the last two years likely driven by rising fuel prices and government incentives.

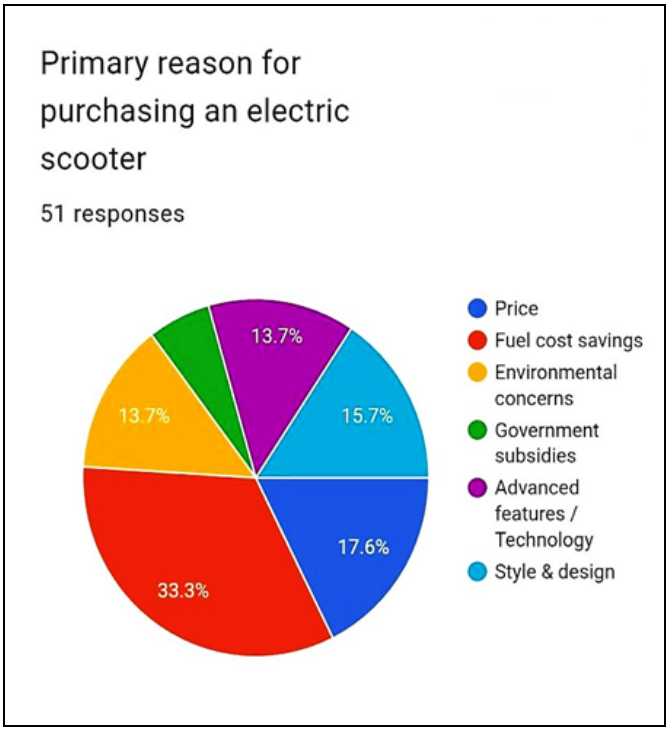
iv). Mode of Financing



Inference: Nearly equal portions of respondents opted for full payment (47.1%) and bank loans/EMI (45.1%), while 7.8%

relied on private financing or dealer finance options.
This balanced split suggests that both middle-income self-financing buyers and credit-dependent consumers are active participants in the EV market, indicating wider financial accessibility of electric scooters.

v). Primary Reason for Purchase:

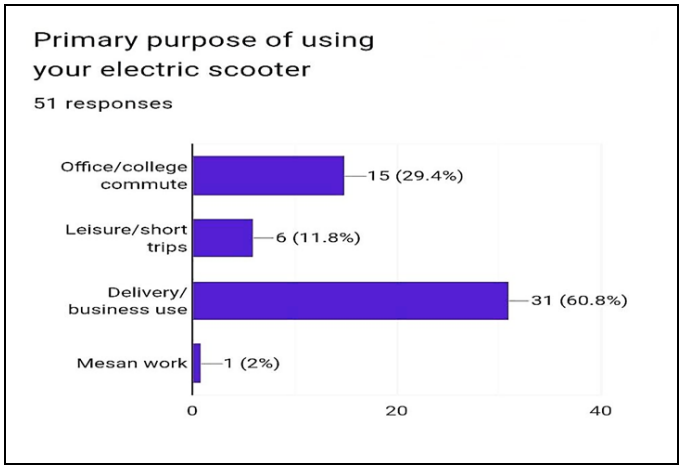


Inference:

- The most cited reason for buying an electric scooter was fuel cost savings (33.3%), indicating that economic benefits are the leading motivator.
- Other influencing factors include price (17.6%), style and design (15.7%), and environmental concerns (13.7%).
- Additionally, advanced features and technology (13.7%) and government subsidies (6%) were also considered.

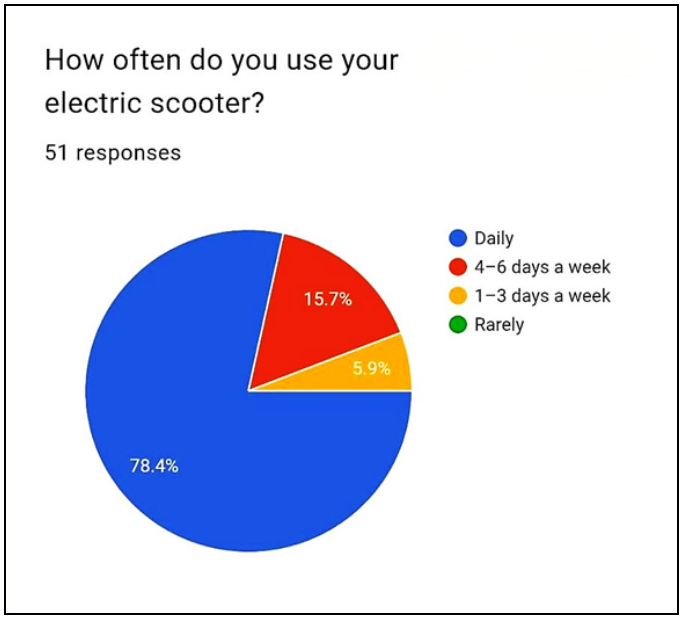
Overall, the data highlights that consumers are primarily cost-conscious, with environmental awareness and design appeal acting as secondary motivators.

vi). Primary Purpose of Use:



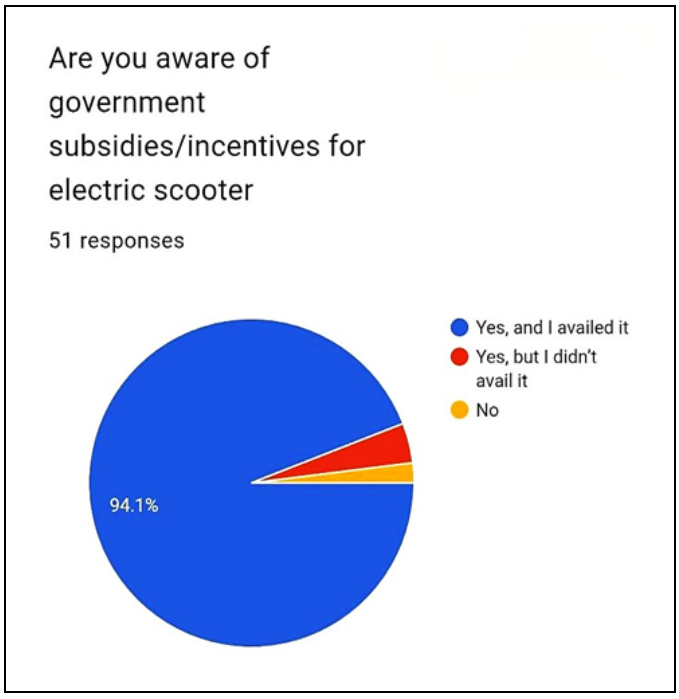
Inference: The majority (60.8%) use their electric scooters for delivery or business-related activities, followed by office/college commuting (29.4%), and leisure/short trips (11.8%). A small proportion (2%) use it for building work-related purposes.
This pattern demonstrates that functional and income-generating uses dominate electric scooter adoption, showing that the EV market is being driven by working-class and small business users in semi-urban and rural areas.

vii). Frequency of Use:



Inference: An overwhelming 78.4% of respondents use their electric scooter daily, while 15.7% use it 4–6 days a week. Only 5.9% use it 1–3 days a week, and none reported rare usage. This finding shows high dependence and regular utilization, reflecting the vehicle's reliability and practicality for daily commuting needs.

4.3. Awareness and Government Subsidy Analysis:

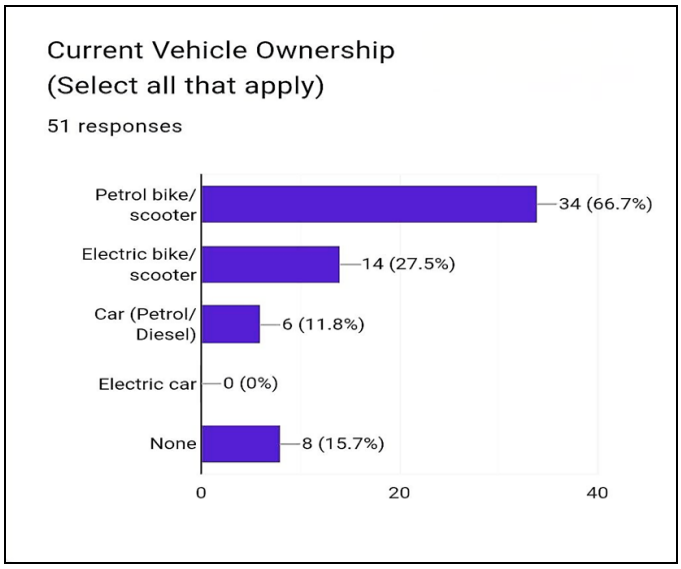


Inference: A striking 94.1% of respondents were aware of

government subsidies and had availed them, indicating effective outreach and awareness campaigns. Only 3.9% knew but didn't avail, and a minimal 2% were unaware.
This demonstrates that policy-level incentives have successfully reached the target audience and are playing a crucial role in promoting EV adoption.

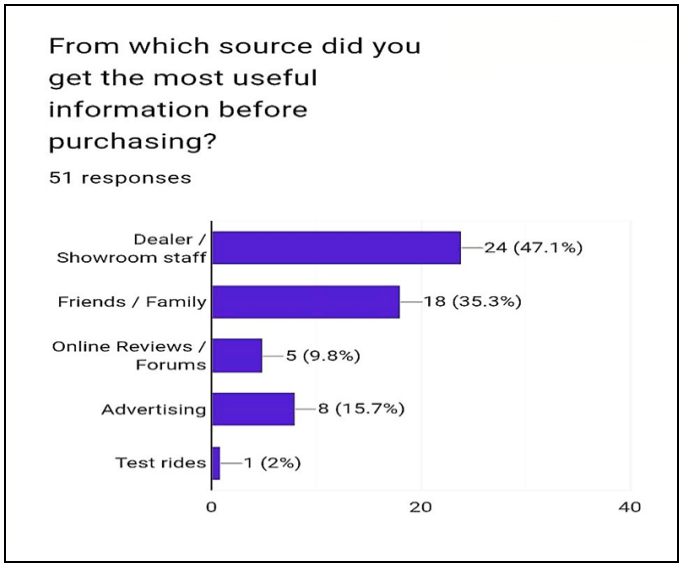
4.4. Vehicle Ownership & Information Sources:

i). Vehicle Ownership:



Inference: The analysis shows that most respondents (66.7%) own petrol bikes/scooters, indicating continued reliance on conventional fuel vehicles. However, 27.5% own electric scooters, showing a growing shift toward EV adoption. Only 11.8% own petrol/diesel cars, and no respondents own electric cars, highlighting the low four-wheeler EV penetration.

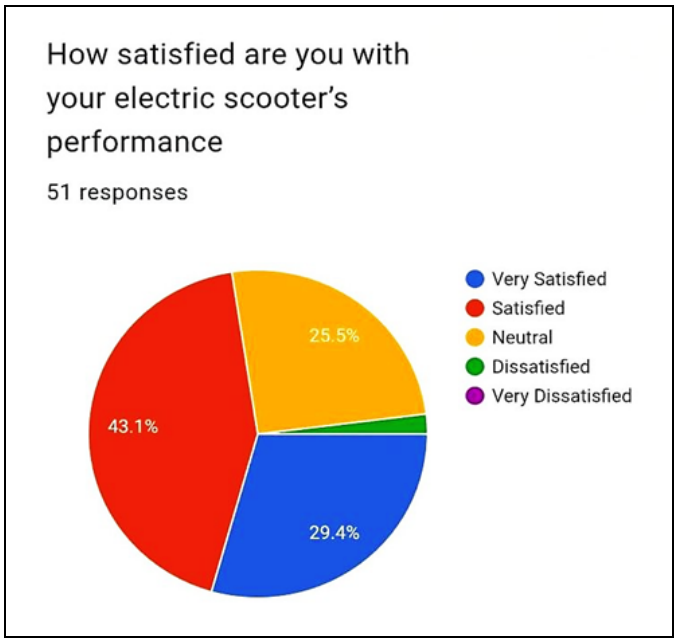
ii). Information Sources:



Inference: Dealers and showroom staff (47.1%) were the most influential, followed by friends and family (35.3%), emphasizing the importance of personal interaction and word-of-mouth. Advertising (15.7%) and online reviews (9.8%) played a minor role, while test rides (2%) were least used. This suggests that consumer decisions are mainly shaped by interpersonal trust and dealer guidance, with limited influence from digital media or direct experience.

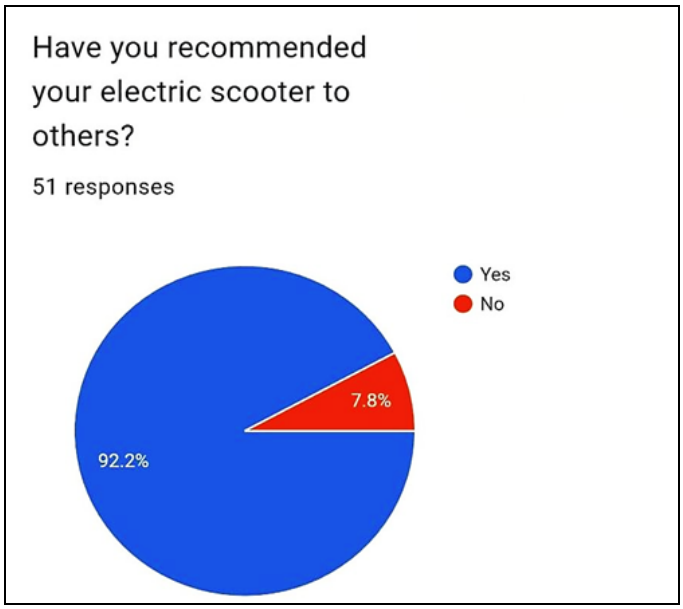
4.5. Satisfaction Levels:

i). Satisfaction of E-scooters performance:



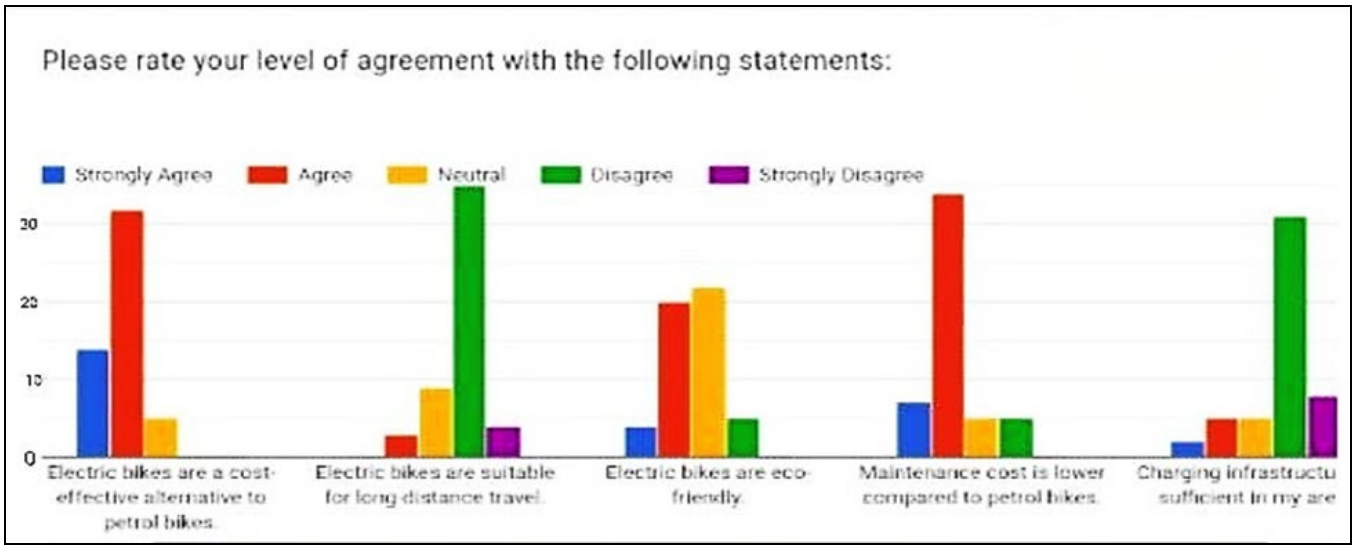
Inference: The results reveal that a majority of respondents (72.5%) are either satisfied or very satisfied with their electric scooter's performance. This indicates a generally positive ownership experience, with users finding their vehicles reliable, efficient, and convenient for daily use. Only a small fraction expressed dissatisfaction, highlighting that performance-related concerns are minimal among the respondents.

ii). Recommendation of E-scooters to others:



Inference: A strong majority of respondents (92.2%) have recommended their electric scooter to others, while only 7.8% have not. This indicates a high level of overall satisfaction and willingness to advocate for EVs among users who did not experience significant maintenance issues. However, the minority who faced problems may be hesitant to promote EVs, suggesting that addressing maintenance challenges and building trust through reliable service networks could further increase positive recommendations and market penetration.

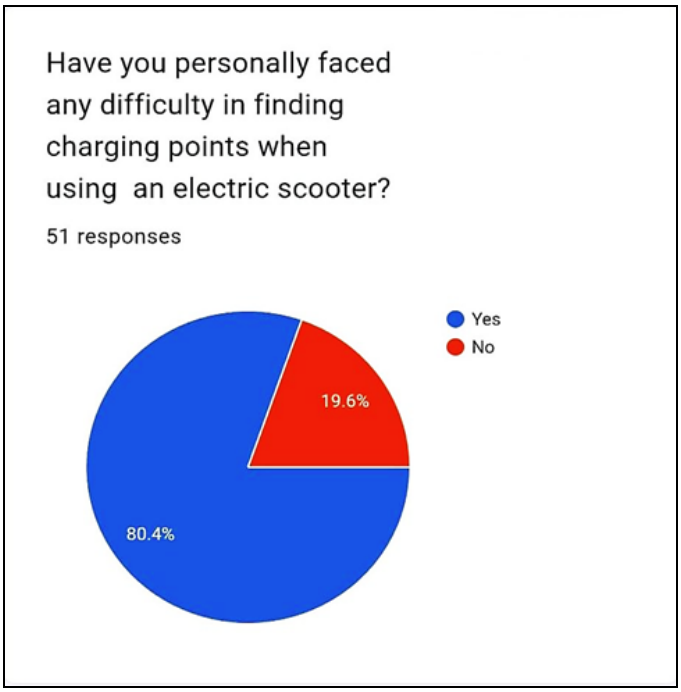
iii). Level of Agreement with Electric Scooter Statements:



Inference: Respondents showed strong agreement that electric scooters are cost-effective and have lower maintenance costs than petrol vehicles, confirming their economic and environmental advantages and they strongly agree that E-scooters are eco-friendly. However, most disagreed that electric bikes are suitable for long-distance travel, reflecting persistent range anxiety among users. Additionally, opinions were divided regarding charging infrastructure, as a majority felt that charging points are insufficient in their locality. These insights suggest that while users appreciate the eco-friendly and economical nature of EVs, improving charging infrastructure and range capabilities remains key to enhancing satisfaction and adoption.

4.6. Barriers in Charging and Maintenance:

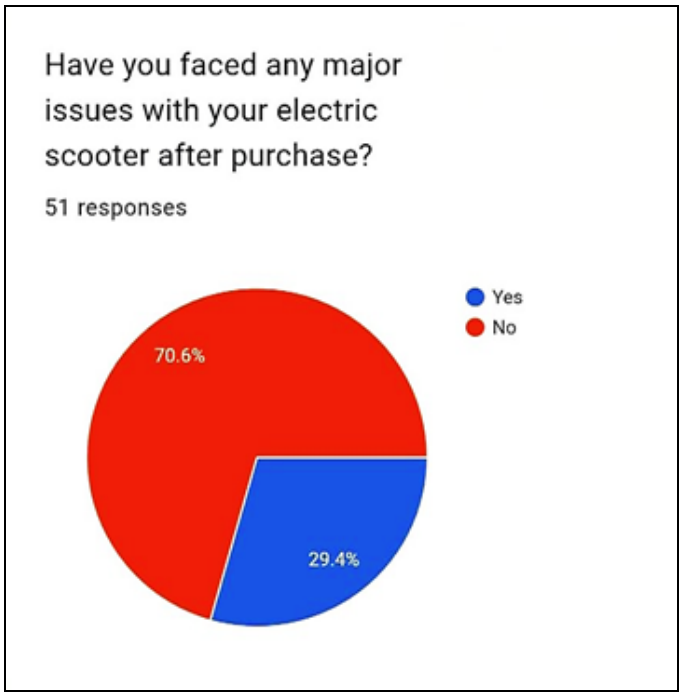
i). Difficulty in Finding Charging Points:



Inference: A large proportion (80.4%) of users reported difficulty in locating charging stations, while only 19.6% did not face such an issue.

This clearly underscores inadequate charging infrastructure as a major challenge in sustaining EV usage, especially in rural and semi-urban locations.

ii). Barriers in Maintenance:



Inference: The survey indicates that 29.4% of respondents have faced major issues with their electric scooter after purchase, while 70.6% reported no significant problems. This suggests that while most users experience reliable performance, a notable minority encounters maintenance or technical challenges, such as battery issues, lack of service centers, or spare part availability. These barriers highlight the need for better after-sales support and improved service infrastructure to enhance user satisfaction.

iii). Improvements Expected in Current Electric Scooters:

Inference: The following are the top improvements expected identified:

Faster Charging and Better Charging Infrastructure:

- Most Frequent Concern (≈ 40%)

- Suggestions included establishing more public charging stations, reducing charging duration, and increasing charging speed. This indicates a strong infrastructural and technological gap that directly affects convenience and daily usability in semi-urban areas.

Improved Battery Life and Mileage:
- Second Most Common Expectation (≈ 30%)
- Users emphasized the need for longer range per charge, improved battery lifespan, and better mileage comparable to petrol bikes. Many also highlighted high battery replacement cost and concerns over battery life, suggesting a lack of trust in battery durability.

Performance and Comfort Enhancements:
- Moderate Concern (≈ 15%)
- Several users requested improved performance, stronger suspension, disc brakes, and better load capacity. These indicate a desire for EVs to match the ruggedness and comfort of petrol scooters, especially in semi-urban terrains.

Design, Storage, and Practical Additions:
- Minor but Notable (≈ 8–10%)
- Users suggested small but practical improvements like front storage space, water bottle holders, and larger luggage boxes, which enhance everyday usability.

Technology and Smart Features:
- Emerging Interest (≈ 5%)
- A few respondents requested modern tech integrations like Bluetooth connectivity and mobile apps for battery tracking, showing an increasing interest in smart mobility features.

Price and Resale Concerns:
- Lesser Mentioned (≈ 3–5%)
- Some participants mentioned high initial cost, uncertain resale value, and lack of transparency in warranty terms as barriers to long-term satisfaction.

5. Research Findings and Discussion

5.1. Overview of findings:

i). Demographic Profile of Users:

Target Group: Middle-aged males (36–45 years) from rural and semi-urban areas, earning ₹20,001–₹40,000, mostly Diploma/Graduate holders, employed in private jobs or self-owned businesses. These are the primary adopters of electric scooters.

Underrepresented Groups: Females (27.5%), younger adults (18–25 years), older adults (56+), urban residents (7.8%), and higher-income or postgraduate-educated individuals. This indicates that EV adoption is limited among women, youth, urban dwellers, and highly educated or high-income segments.

ii). Factors Influencing Purchase Decisions: Electric scooters are predominantly purchased by cost-conscious consumers prioritizing fuel savings and functional use (delivery or commuting). Most buyers decide quickly, often within one month, reflecting responsiveness to immediate economic and practical benefits. Groups less represented include those motivated mainly by environmental concerns, style, leisure, or long-term resale value, indicating lower appeal among lifestyle-oriented or cautious buyers.

iii). Usage Patterns and Financing: Electric scooters are heavily used for daily commuting (78.4%) and work-related activities (60.8%), indicating high reliance. Financing is evenly split between full payment and bank loans/EMIs, reflecting accessibility across middle-income users.

iv). Awareness and Policy Impact: A vast majority of users are well-informed about government subsidies and have availed them, demonstrating effective outreach to the primary consumer segment. However, a small fraction remains unaware or chooses not to utilize subsidies, pointing to minor gaps in information access or program uptake.

v). Satisfaction and Recommendations: Most users own petrol bikes or scooters, with electric scooters gradually gaining traction. Decisions are strongly influenced by dealers and personal networks, highlighting trust in interpersonal guidance. Conversely, digital media, online reviews, and electric cars play a minimal role in adoption, indicating low engagement with urban, tech-savvy, or four-wheeler EV users.

vi). Barriers and Improvement Needs: Charging infrastructure and battery performance are the most cited challenges, affecting convenience and trust. Maintenance issues are relatively low (29.4%), but improved after-sales support is desired. Users suggest enhancements such as faster charging, longer battery life, performance upgrades, and practical design improvements. Interest in smart features is emerging but currently minor.

vii). Information Sources and Influence: Decisions are mainly shaped by dealers/showroom staff (47.1%) and friends/family (35.3%), indicating strong reliance on interpersonal trust and personal recommendations. Digital media and online reviews have minimal influence on purchase behavior.

5.2. Major Findings in Relation to Objectives:

- The analysis reveals that consumer perception of electric scooters in Erode is generally positive and practical. Most respondents (72.5%) are satisfied with their scooter's performance, and a remarkable 92.2% have recommended EVs to others, showing trust and acceptance of the technology. Respondents strongly agree that electric scooters are cost-effective, low-maintenance, and eco-friendly, confirming their awareness of the environmental and financial benefits. However, the perception of EVs as suitable only for short-distance travel persists, mainly due to limited charging infrastructure and range anxiety, indicating that while the overall perception is favourable, infrastructural and technical improvements are still necessary.
- Economic practicality emerged as the dominant influence on purchase decisions. The main motivations include fuel cost savings (33.3%), followed by affordable pricing, modern design, and environmental awareness. Most users purchased their EVs within the last two years, indicating recent adoption growth driven by rising fuel prices and government subsidies (94.1% awareness). Furthermore, 60.8% of users use their EVs for work or business, reflecting that adoption is mainly driven by functional and income-related needs rather than luxury or lifestyle appeal. The equal split between full payment and EMI financing shows that EVs are accessible across various

income groups, emphasizing affordability and practicality as key decision drivers.

Despite positive perception, several barriers remain:

- Charging infrastructure is the most critical issue is 80.4% face difficulty finding charging points, highlighting infrastructural inadequacy in rural and semi-urban regions.
- Long charging time (51%), limited range (47.1%), and high battery replacement cost (39.2%) are major pre-purchase concerns.
- Around 29.4% of users have faced post-purchase maintenance issues due to poor service availability or battery-related problems.
- Users expect faster charging, better mileage, improved battery life, and enhanced comfort and safety features in future models.

These findings emphasize that technological reliability, maintenance support, and charging convenience are key to sustaining consumer confidence and accelerating adoption in Erode.

5.3. Managerial and Policy Implications:

i). Managerial Implications:

Targeted Marketing and Consumer Engagement: Focus marketing efforts on middle-aged, rural, and semi-urban males, emphasizing fuel savings, affordability, and functional use. Expand outreach to underrepresented groups (women, youth, urban, higher-income consumers) by highlighting environmental benefits, modern design, and lifestyle appeal. Leverage dealers and personal networks for promotions, as they are the most trusted information sources.

Product and Service Improvements: Enhance battery life, driving range, and charging speed to address the most pressing concerns. Incorporate performance, comfort, and practical design upgrades, such as suspension improvements, disc brakes, and additional storage space. Introduce smart features (Bluetooth connectivity, battery tracking apps) to attract early adopters and tech-savvy consumers. Strengthen after-sales support and ensure wider availability of service centers, spare parts, and transparent warranty policies.

Sales Strategy: Encourage test rides, on-site demonstrations, and community campaigns in rural and semi-urban areas to boost confidence and adoption.

ii). Policy Implications

Infrastructure Development: Accelerate establishment of public charging stations, particularly in rural and semi-urban regions. Support fast-charging technology adoption to reduce waiting times and increase convenience for daily users.

Financial Incentives and Subsidies: Continue and expand government subsidies, which have proven effective in promoting adoption (94.1% awareness). Introduce schemes targeting women, youth, and urban buyers to broaden the EV consumer base.

Awareness and Education Programs: Implement digital and community campaigns to inform underrepresented groups about EV benefits, environmental impact, and practical usage. Educate consumers on charging infrastructure, maintenance, and battery replacement to reduce apprehension and range anxiety.

Regulatory Support and Innovation: Encourage standardization of battery and charging infrastructure to improve reliability and interoperability. Incentivize manufacturers to improve durability, performance, and affordability, aligning product development with consumer expectations. Promote four-wheeler EV adoption and integration of smart mobility solutions to expand the overall EV ecosystem.

Suggestions and Recommendation

Consumer Awareness and Outreach: Design marketing campaigns focusing on middle-aged males in rural and semi-urban areas, emphasizing affordability, fuel savings, and practical use. Expand awareness programs for underrepresented groups such as women, youth, urban residents, and higher-income consumers, highlighting environmental benefits, modern design, and lifestyle appeal. Leverage existing EV users as brand advocates, as they strongly influence peers' purchase decisions. Dealers should ensure excellent service to maintain this positive word-of-mouth effect.

Sales Strategy: Sales efforts should be guided by localized market research to identify high-potential segments, tailoring campaigns to core users with messages about fuel efficiency, eco-friendliness, and practicality, while emphasizing style, technology, and environmental impact for secondary groups. Collaboration with manufacturers can improve product features, including battery performance, charging speed, comfort, storage, and smart technology, supported by expanded after-sales services such as service centers, spare parts, and warranties. Flexible financing options and education on government subsidies will enhance affordability, while partnerships with policymakers and local authorities can strengthen charging infrastructure, safety standards, and awareness programs. Continuous monitoring of sales, customer satisfaction, and campaign effectiveness will allow strategies to adapt over time, ensuring a practical, targeted, and scalable approach.

Charging Infrastructure and Accessibility: Rapidly expand public charging stations, especially in rural and semi-urban regions. Introduce fast-charging facilities to reduce charging time and enhance convenience for daily commuters. Utilize existing petrol stations to host EV charging points, increasing accessibility and convenience for users. Benchmark and compare with foreign countries such as Norway, the Netherlands, and China, where dense charging networks, fast chargers, and interoperable systems support higher EV adoption. Learning from their best practices can help design effective infrastructure in India. Ensure visibility and accessibility of charging stations through apps, local maps, and signage.

Product Enhancement and Technological Improvements: The following are the primary improvements that the consumers want such as Improve battery life, mileage, and driving range to address range anxiety. Upgrade scooter performance, comfort, and safety features, including suspension, disc brakes, and storage capacity. Introduce smart features such as app-based battery tracking, route planning, and Bluetooth connectivity to attract tech-savvy and early adopters.

Strengthening After-Sales Support: Effective after-sales support is a key factor in sustaining consumer trust and boosting EV adoption. Survey findings indicate that satisfied users strongly influence peers to purchase EVs, so high-quality service can directly enhance market growth. Expand and standardize service centers across rural, semi-urban, and urban areas. Introduce doorstep or mobile servicing for repairs, battery replacement, and maintenance, especially in

remote regions. Develop an app-based system for service requests, tracking, and warranty claims. Offer extended warranties and bundled maintenance packages to build confidence. Train dealer staff to provide consistent, high-quality service, ensuring users remain satisfied and become advocates for EV adoption. By learning from established practices in automobiles, consumer electronics, and two-wheeler industries, EV companies can create a robust after-sales ecosystem, reduce maintenance-related hesitancy, and accelerate adoption.

Financial Accessibility, Offers, and Incentives: Using festival sales, limited-time offers, and EMI options to drive purchases, EV dealers can provide festival-time discounts, cashback, and EMI schemes to attract new buyers. Flexible financing and targeted subsidies can increase adoption among underrepresented groups, just as seasonal promotions in FMCG or apparel sectors stimulate consumer purchases during peak seasons. Bundled offers, such as free accessories, extended warranties, or maintenance packages, can incentivize hesitant buyers, mirroring strategies used by automobile and consumer electronics industries.

Promoting Functional and Lifestyle Adoption: Drawing from the automobile and two-wheeler sectors, where test drives, demo rides, and experiential campaigns are common, EV companies can organize community events and test ride campaigns to showcase performance and practicality. Lifestyle branding used in the fashion and tech industries highlighting aesthetics, smart features, and eco-friendliness can be applied to EVs to appeal to tech-savvy, or youth segments. Functional adoption strategies can also take cues from delivery/logistics industries, emphasizing income-generating potential (e.g., for delivery services), which increases perceived value and encourages adoption among working-class users.

Policy and Regulatory Recommendations: Standardize battery and charging infrastructure for reliability and interoperability. Encourage manufacturers to enhance durability, performance, and affordability, taking cues from consumer electronics, where regular product updates and quality improvements drove trust and repeat purchases. Overall, regulatory frameworks and incentives should enable a robust ecosystem, ensuring consistent availability, high-quality service, and interoperability, as seen in other successful technology-driven industries.

Conclusion

The present study on consumer buying behavior towards electric scooters in Ammapettai, a semi-urban town in Erode district, provides valuable insights into the evolving landscape of electric mobility in semi-urban India. The research highlights that while the adoption of electric two-wheelers is gaining momentum, several factors continue to influence consumer decisions, including price, performance, brand perception, charging infrastructure, government incentives, and environmental awareness. Findings reveal that affordability and fuel cost savings remain primary motivators for purchase, while environmental concerns and advanced features also contribute to adoption, particularly among younger and environmentally conscious consumers. Government initiatives such as subsidies, tax exemptions, and policy support play a significant role in encouraging adoption, though awareness and accessibility of these incentives remain uneven in semi-urban regions. Barriers such as high initial costs, limited charging infrastructure, and concerns about battery life and resale value still pose challenges to wider adoption. Despite these limitations, users who have purchased electric scooters generally report satisfactory experiences and demonstrate a willingness to recommend them to peers, indicating the potential of word-of-mouth promotion in boosting adoption. The study underscores the importance of targeted marketing strategies, improved service and charging infrastructure, and enhanced consumer awareness programs to address the unique needs of semi-urban buyers. By focusing on local consumer preferences and addressing practical barriers, manufacturers, policymakers, and dealers can facilitate a smoother transition towards sustainable and eco-friendly mobility. In conclusion, electric scooters represent a viable and increasingly accepted mode of transport in semi-urban towns like Ammapettai. Understanding consumer perceptions, motivators, and challenges is critical to fostering broader EV adoption and ensuring that India's electric mobility revolution reaches beyond urban centers to create an inclusive and sustainable transportation ecosystem.

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