

A Study on Sustainable Development with Electric Vehicles Production in India

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ABSTRACT

Transitioning toward electric mobility forms a central pillar of India's sustainability and climate strategy. This research looks at how EVs contribute to the reduction of emissions and the reliance on fossil fuel energy sources, leading to a more sustainable transportation system. Using both doctrinal and non-doctrinal methods, the study combines policy analysis with real-world insights to offer a clear view of EV adoption. The findings show that major obstacles to adoption are poor charging infrastructure, high upfront costs, limited battery efficiency, and inconsistent policies at both the central and state levels. Consumer hesitation, fueled by concerns about affordability, range anxiety, and a lack of awareness, further delays the transition. On the supply side, manufacturers face issues with increasing production, managing supply chains, and maintaining demand. Despite these challenges, the study highlights that adopting EVs can lead to significant benefits, such as better urban air quality, decreased oil imports, job opportunities in green industries, and enhanced energy security.

Keywords: Electric Vehicles, Sustainable Development, Green Mobility, Policy Implementation, Charging Infrastructure, Consumer Behaviour, Renewable Energy Integration, Energy Security

1. INTRODUCTION

Sustainable development in India closely relates to tackling climate change, cutting down on fossil fuel use, and making sure that growth is friendly to the environment. The transport sector is a major source of greenhouse gas emissions, so Electric Vehicles (EVs) are becoming a key solution for greener mobility. Their use supports India's commitments under the Paris Agreement and addresses the pollution and congestion linked to urban growth. When charged through renewable energy, electric vehicles also improve air quality and reduce the need for oil imports (World Bank, 2021). Therefore, shifting to EVs is a crucial step for India to reach its sustainable development goals.

However, India's adoption of EVs faces several challenges despite initiatives like FAME II. Poor policy enforcement, a lack of charging stations—especially in rural and semi-urban areas, and high initial costs discourage consumers. Concerns about battery limitations, range anxiety, and low awareness slow down the transition even more. Policy inconsistencies between central and state governments add to the obstacles, while manufacturers struggle with scaling operations, supply chain interruptions, and uncertain demand. Strengthening public-private partnerships, enhancing infrastructure, and increasing strategic investments are essential for creating a sustainable EV ecosystem in India.

2. STATEMENT OF THE PROBLEM

The use of Electric Vehicles (EVs) in India is still low, even with government programs like FAME I and II. Major challenges include a lack of charging stations, especially outside cities, and high upfront costs that make them hard to afford, even though they are cheaper to run. Limitations with batteries, worries about range, and low consumer knowledge further reduce confidence. Additionally, inconsistent policies from central and state governments confuse. On the industry side, manufacturers deal with supply chain issues, limited scale, and fluctuating demand. The difference between policy goals and what happens in the market shows that we need better implementation, improved infrastructure, and more acceptance from consumers.

3. REVIEW OF LITERATURE

Jain, M. (2024). An empirical study on electric vehicle adoption in India¹. This study looks at consumer adoption trends across Indian cities. It finds that EV penetration is mostly in urban areas with higher incomes and better charging facilities. Affordability, awareness, and range anxiety are significant barriers to widespread adoption. The research highlights the need for strategies tailored to specific regions and calls for more city-level demand studies.

Kohli / ICCT (2024). Electric vehicle demand incentives in India²: The FAME II scheme and considerations for a potential next phase. This policy review examines the design and results of the FAME II scheme, revealing positive but uneven outcomes. While incentives have supported growth in some vehicle categories, poor use of funds and slow installation of charging stations are major issues. The authors recommend that Phase III should broaden coverage, enhance charging infrastructure, and simplify fund distribution.

Mastoi, M. S. et al. (2022). An in-depth analysis of EV charging station planning and challenges³. Mastoi and colleagues (2022) suggested that obstacles to the growth of charging stations consist of land usage, grid capacity, and standards. It stresses that without fast-charging corridors and clear regulatory support, the adoption of EVs will remain slow. The study recommends public-private partnerships and zoning reforms as possible solutions.

Secinaro, S. et al. (2022), Electric vehicles' consumer behaviours⁴: In a bibliometric review conducted by Secinaro et al. (2022), factors that connect the adoption of electric vehicles and environmental attitudes, and social norming were explored. It concludes that combining behavioural economics with policy measures is necessary to improve adoption rates.

4. RESEARCH GAP

While many studies demonstrate the environmental benefits of Electric Vehicles (EVs) and supportive policies, thorough analysis remains limited. Most research in India examines policy or environmental outcomes separately, overlooking consumer behaviours such as willingness to pay, awareness, and attitudes. There's also a lack of exploration regarding manufacturers' readiness for large-scale production and the blending of renewable energy with charging networks. Differences between urban and rural

¹ Jain, M. (2024). *An empirical study on electric vehicle adoption in India*. [Source: ResearchGate/SSRN].

² Kohli / ICCT. (2024). *Electric vehicle demand incentives in India: The FAME II scheme and considerations for a potential next phase*. International Council on Clean Transportation.

³ Mastoi, M. S. et al. (2022). *An in-depth analysis of EV charging station planning and challenges*. Energy Reports.

⁴ Secinaro, S. et al. (2022). *Electric vehicles' consumer behaviours: mapping the field*. Transportation Research Part D: Transport and Environment.

adoption add to the issue, and the absence of comparisons between policy/legal and empirical perspectives makes the gap even wider. This study aims to fill these gaps by analysing policy, infrastructure, consumer behaviour, and industry preparedness for sustainable EV adoption in India.

5. OBJECTIVES OF THE STUDY

1. To analyse the way Electric Vehicles (EVs) are helping to achieve sustainable development goals in India.
2. To evaluate the current government policies, subsidies, and incentives.
3. To look into consumer behaviour, awareness, and readiness to adopt EVs in urban and semi-urban areas.
4. To suggest strategies and policy recommendations to close the gap between policy goals and actual implementation.
5. To find out major infrastructure challenges, such as charging stations and battery technology.

6. METHODOLOGY

This research uses both doctrinal and non-doctrinal approaches to ensure a thorough analysis. The data has been collected from various sources, including well-known newspapers, academic journals, magazines, official reports, and reliable online resources. This variety improves the reliability of the findings. To interpret the data effectively, we used statistical tools like the percentage method and the average method. The study is based on a sample of 54 respondents, carefully chosen to reflect relevant perspectives. It has been conducted over five months, allowing enough time for detailed observation and analysis.

7. SIGNIFICANCE OF THE STUDY

For individuals and consumers, studying Electric Vehicles (EVs) is helpful. It provides insight into sustainable mobility choices, enabling people to understand cleaner options compared to traditional fuel-based transportation. It also reveals how factors like affordability, charging convenience, and awareness affect the shift to EVs. For the government, this information is important for creating policies based on real data instead of assumptions. This leads to better-targeted incentives, more efficient resource utilisation, and clearer policies. It also helps in planning and expanding charging infrastructure in both cities and rural areas while promoting the use of renewable energy. Most importantly, these actions help increase EV adoption rates, build consumer confidence, and speed up India's shift to sustainable electric mobility.

8. HYPOTHESIS OF THE STUDY

H1: Effective government policies combined with robust charging infrastructure significantly influence the adoption of Electric Vehicles (EVs) in India.

H2: Consumer awareness, affordability, and perceived environmental benefits have a positive and direct impact on the willingness of Indian consumers to adopt Electric Vehicles.

9. LIMITATIONS OF THE STUDY

The study has some limitations, primarily due to its length and method. Conducted over five months, the research cannot capture long-term trends, the effects of policies, or shifts in consumer attitudes toward

Electric Vehicles (EVs). It may also miss seasonal changes in usage patterns. Furthermore, relying on questionnaires as the primary survey method weakens the data's reliability. Responses depend on individual perceptions and self-reporting, which can lead to bias, incomplete answers, or limited knowledge about EV technology. With only 100 respondents, the findings may not be representative of India's diverse demographics and regions. These issues underscore the need for more comprehensive, long-term, and mixed-method studies to gain deeper insights into EV adoption in India.

10. RESULT AND DISCUSSION

PART- A DOCTRINAL RESEARCH

Electrifying road transport in India can support sustainable development goals if three legal and policy conditions are met and enforced. First, decarbonizing the electricity supply or implementing strict charging rules is essential. Second, there needs to be an effective circular economy for batteries, including collection, recycling, and domestic refining. Third, we require coordinated and long-term demand-side incentives along with infrastructure mandates to bridge the urban and rural charging gap. Without these conditions, deploying electric vehicles may improve local air quality, but it could lead to limited or uncertain lifecycle greenhouse gas gains and significant environmental risks at the end of the vehicles' life.

A. Net emissions depend on the electricity mix and charging practices

According to ICCT (2023), lifecycle emission benefits of BEVs depend largely on the electricity-generation mix. Where the grid remains coal-intensive, BEVs' lifecycle GHG advantage shrinks and can be small for some segments; as the grid decarbonises, BEV benefits grow markedly. This legal implication is that environmental regulation for EVs must be coordinated with energy-sector decarbonisation targets and grid-integration rules (time-of-day tariffs, managed charging). Policy needs to connect EV incentives to grid-decarbonization goals. It should also require standardised LCA disclosures from vehicle manufacturers to ensure public incentives lead to real reductions in lifecycle emissions. In areas where the grid relies heavily on coal, managed charging and renewable procurement for fleets can achieve short-term benefits.⁵

B. Adoption and market trends — policy matters

India's EV penetration has accelerated in two- and three-wheelers and is rising in cars, but overall penetration still lags major markets; growth to date has been driven strongly by targeted incentives (FAME schemes), state subsidies and nascent manufacturing incentives. This supports a doctrinal point: **temporary subsidies alone are insufficient**; law should create predictable long-term incentives and regulatory certainty (e.g., stable standards, second-life rules) to sustain private investment.

The picture below depicts that:

Recent statistics show EV sales exceeded around two million units in FY 2024-25 (EV Reporter, 2025).

This growth is mainly driven by two-wheelers and three-wheelers.

Two-wheelers lead in consumer adoption. Forecasts indicate the largest gains in battery electric vehicle (BEV) penetration will come from the two-wheeler and three-wheeler segments through 2030, while passenger cars will lag.

⁵ ICCT (2023) – Life-Cycle Greenhouse Gas Emissions of India's EVs

Fleet and commercial electrification, including deliveries, taxis, and three-wheelers, is a key factor in near-term growth. This trend is supported by clearer total cost of ownership (TCO) benefits and centralized charging options.

Policy changes, such as FAME, PLI, and PM E-DRIVE, have significantly impacted short-term sales, causing visible monthly and quarterly dips and rebounds in response to subsidy adjustments.

The market is concentrated, with a few original equipment manufacturers (OEMs) and brands, like Ola, TVS, Bajaj, and Ather, controlling a large share of the two-wheeler EV market. This concentration influences retail pricing, charging partnerships, and after-sales services.

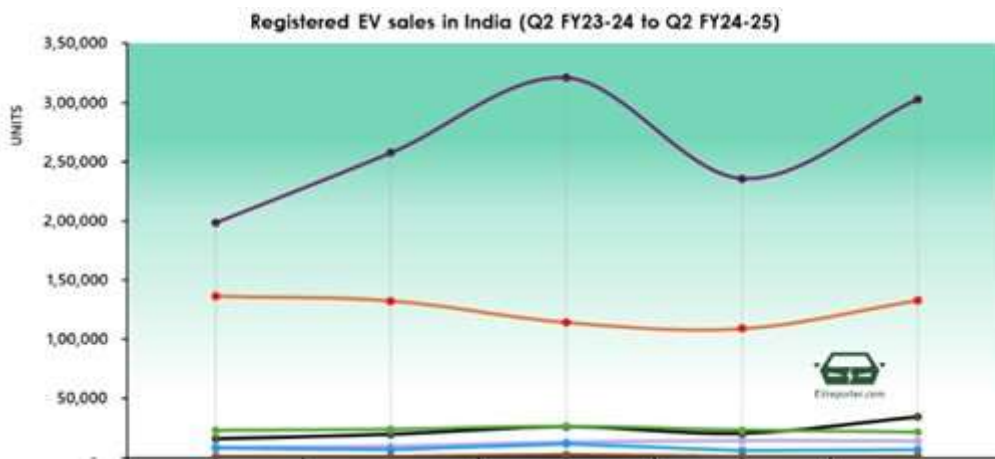


Fig. 10 .2: Quarterly EV sales snapshot (EVreporter) — monthly/quarterly sales time-series across segments (2W, 3W, passenger, goods).⁶

Visibility and convenience drive retail uptake. Consumers are more likely to adopt when they can see chargers, test-drive vehicles, and access service networks. This explains why dense urban centres and states with better charging coverage show higher private adoption. Segment preferences reflect risk tolerance and use cases. Price-sensitive individual buyers prefer low-cost two-wheelers and shorter-range models. Commercial operators choose electric vehicles earlier because fuel savings and predictable routes reduce payback time. Advertising environmental benefits helps only a portion of the market. Convenience and operating costs matter the most. Information and resale concerns slow some buyers.

	Q2 FY 23-24	Q3 FY 23-24	Q4 FY 23-24	Q1 FY 24-25	Q2 FY 24-25
e-2W	1,98,153	2,57,372	3,20,720	2,35,640	3,02,614
e-rickshaw	1,36,324	1,32,424	1,14,431	1,09,213	1,32,804
e-cart	8,919	9,910	13,267	14,364	14,161
3W Pax L5	15,901	19,860	26,223	20,611	34,656
3W Goods L5	8,115	6,873	11,867	6,104	6,751
e-4W	23,202	24,089	26,762	23,422	21,482
e-Bus	702	1,054	1,267	585	1,148
Others	907	1,003	2,838	1,100	1,344
Total	3,92,223	4,52,585	5,17,375	4,11,039	5,14,960

⁶ Quarterly EV sales snapshot (registered EVs across segments, India) — EVreporter (Vahan-derived data, latest quarters). <https://evreporter.com/wp-content/uploads/2025/05/EVreporter-India-EV-Report-FY24-25.pdf>

Table no. 1 Quarterly EV sales snapshot (Interpretation of the graph in Fig. 10.2)

Pair chargers with grid and local planning. Rapid sales growth requires coordinated distribution company planning, managed-charging pilots, and public charger density targets to prevent local constraints and maintain consumer confidence. Mandate clear battery warranties, standardised battery data (health and cycle count), and enable buyback or extended producer responsibility frameworks so resale and end-of-life risks do not deter buyers.

C. Charging infrastructure and grid impacts

EV Reporter (2024) further states that there is a concentration of charging points in Delhi, Maharashtra, and Karnataka, while other parts of the country are underserved. Thus, doctrines on land-use planning, public-utility obligations, and DISCOM regulation must be aligned with minimum charging-station rollout targets, interoperability, and data-sharing rules to facilitate grid-friendly charging. Charger density is highly uneven, as it is concentrated in Maharashtra, Delhi, and Karnataka.⁷



Fig 10.6: Distribution of public EV charging stations across Indian states (state totals).⁸

The following table shows the breakdown of 148 EV charging stations commissioned under the FAME India Scheme Phase II as of 2 Feb 2024

S. No.	State / Union Territory	No. of EV charging stations commissioned under FAME II
1	Gujarat	53
2	Kerala	30
3	Delhi	21
4	Maharashtra	13
5	Tamil Nadu	13
6	Uttar Pradesh	11
7	West Bengal	3
8	Haryana	2
9	Karnataka	1
10	Meghalaya	1

As of Feb 2, 2024

Table no.2 FAME India Scheme Phase II as of 2 Feb 2024⁹

⁷ EVReporter 2024 article – ‘12,146 Public EV Charging Stations Operational’

⁸ Source: <https://evreporter.com/12146-operational-public-ev-charging-stations-nationwide/?utm>

⁹ Source: <https://evreporter.com/12146-operational-public-ev-charging-stations-nationwide/?utm>

Charger density is highly uneven, with most chargers found in Maharashtra, Delhi, and Karnataka. Consumers in areas with fewer chargers feel more range anxiety. They tend to prefer vehicles that can charge reliably at home or offer fast charging options. Many also look for cars with smaller batteries and lower prices. Urban buyers feel more comfortable switching to electric vehicles. In contrast, rural and peri-urban consumers tend to delay their adoption until public charging options become more available. The legal and administrative focus should prioritize setting minimum public charger targets for each urban area.

Legal-policy prescriptions derived from the result:

Synchronise EV policy with power-sector decarbonisation — link subsidy phasing and vehicle incentives to measurable grid-decarbonisation milestones (e.g., share of non-fossil generation or emission intensity thresholds).

Regulate charging deployment and interoperability — minimum public charging density targets, standardised communication/protocols, and obligations on CPOs (charge-point operators) to report utilization data to DISCOMs for planning.

Adopt managed-charging/ToU frameworks and pilot demand response to avoid distribution upgrades and reduce lifecycle emissions by shifting charging to low-carbon hours.

Design transitional but credible incentive pathways — move from purchase subsidies to outcome-based incentives (e.g., lower total cost of ownership, fleet electrification obligations, PLI for battery value chains) to maintain investor certainty.

Relevant Case Laws

Centre for Public Interest Litigation & Ors. vs. Union of India & Anr. (2019 PIL) ¹⁰

In this important PIL filed in 2019, “the Supreme Court ordered the Union Government to provide status reports on its efforts to promote electric vehicles and develop essential charging infrastructure.” The petitioners claimed that the government had not met its own target from 2012, which aimed for 70 lakh EVs by 2020. By 2025, only 35 lakh were on the roads, while fossil-fuel vehicles continued to create serious pollution and health risks. The court highlighted the government’s duty under Articles 14 and 21 to protect citizens’ right to a clean and healthy environment. It called for accountability in implementing policies, stressing that market readiness, public trust, and infrastructure were crucial for EV adoption. The Court also mentioned alternative fuel technologies, strategies for reducing emissions, and “feebate” systems to encourage the use of EVs. This case has played a key role in prompting the government to speed up EV policies and infrastructure development across India.

Bombay High Court, Amit Dholakia vs. State of Maharashtra (2025)¹¹

This important judgment dealt with the right of EV owners to set up private charging stations in housing societies. This is a key infrastructure issue that has been holding back the adoption of EVs in urban areas. The Court acknowledged the importance of EV infrastructure for reducing pollution and supporting sustainable development. It ruled that the refusal was unlawful, lacking clear regulatory grounds, and ordered state authorities to require housing societies to permit EV chargers. This decision removes a major regulatory barrier and sets a legal precedent that supports EV ownership and infrastructure development in residential areas.

¹⁰ Source: <https://shorturl.at/4P7uH>

¹¹ Source: <https://www.indialaw.in/blog/civil/bombay-hc-ev-charging-station-housing-societies/>

Supreme Court Summons Transport Minister on EV Policy Implementation (2025) ¹²

In a notable hearing, the Supreme Court called on the Transport Minister to explain the delays and shortcomings in the adoption of electric vehicles and the development of charging infrastructure. The Court voiced concern about the slow progress despite the current government programs. It stressed the importance of active government involvement in promoting electric vehicles nationwide. This action highlights the judiciary's increasing role in making sure sustainability policies are put into practice. The Court is advocating for clearer plans, more investment in infrastructure, and coordinated efforts to achieve climate and pollution targets.

PART B – NON-DOCTRINAL RESEARCH

This brief survey was conducted to collect real-world, non-doctrinal evidence on public awareness, attitudes, and perceived obstacles to electric-vehicle (EV) adoption in India, focusing specifically on sustainability perceptions, charging infrastructure concerns, reliability expectations, and support for government incentives. Sample size N = 54. The respondent profile leaned heavily abstaining to 'urban' (Urban = 50, 92.6%), while rural consisted of a modest sample (Rural = 3, 5.6%) and 1 Semi-Urban (1.9%). Education skewed degree/PG holders.

TABLE NO. 1 for Do you believe EVs contribute to sustainable development (reduced pollution, renewable energy use, etc.)?

Gender	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Female	10 (18.5)	8 (14.8)	5 (9.3)	5 (9.3)	1 (1.9)	29 (53.7)
Male	12 (22.2)	6 (11.1)	5 (9.3)	0 (0.0)	2 (3.7)	25 (46.3)
Transgender	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	22 (40.7)	14 (25.9)	10 (18.5)	5 (9.3)	3 (5.6)	54 (100.0)

Source: Primary Source

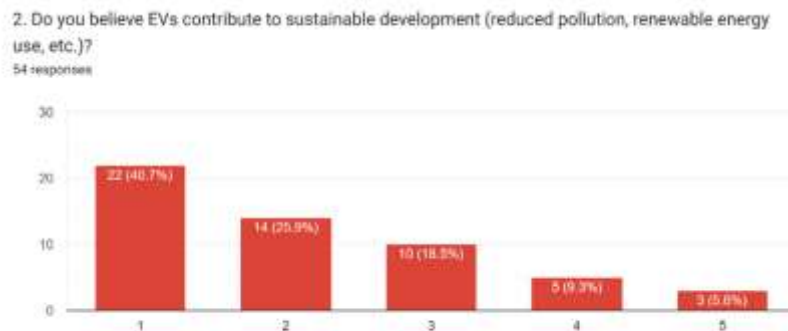


Table No. 1 shows that the majority of respondents tend to believe that electric vehicles contribute to sustainable development, with higher female respondents strongly agreeing at 53.7 percentage in total and

¹² Source: <https://shorturl.at/Khgcs>

18.5 strongly agreeing with the statement and 1.9 percentage strongly disagree. Male respondents of 46.3 percentage strongly agree with 22.2 percentage and 3.7 percentage strongly disagree, and Transgender of 0.0 percentage, hence reflecting a general positive sentiment. Distribution by gender indicates that both males and females largely sit on the agree side, with only a few signs of strong disagreement.

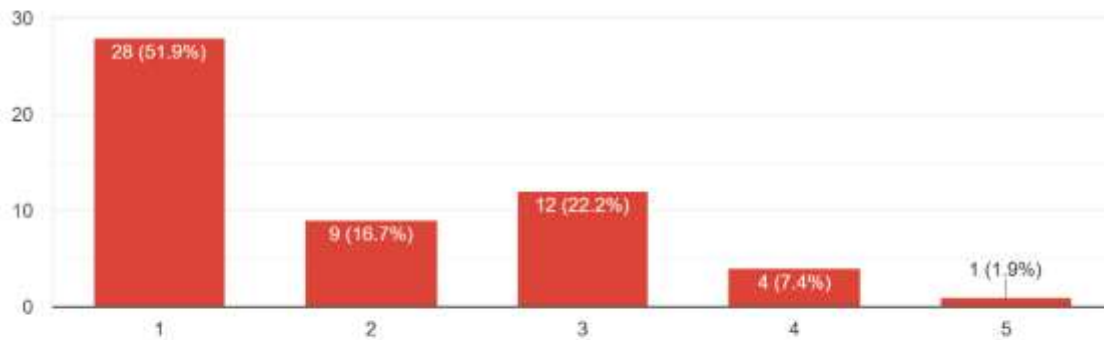
TABLE NO. 2 for Lack of charging infrastructure is the biggest obstacle to EV adoption.

Nativity	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Rural	2 (3.7)	1 (1.9)	0 (0.0)	0 (0.0)	0 (0.0)	3 (5.6)
Semi Urban	0 (0.0)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	1 (1.9)
Urban	26 (48.1)	8 (14.8)	11 (20.4)	4 (7.4)	1 (1.9)	50 (92.6)
Total	28 (51.9)	9 (16.7)	12 (22.2)	4 (7.4)	1 (1.9)	54 (100.0)

Source: Primary Source

3. Lack of charging infrastructure is the biggest obstacle to EV adoption.

54 responses



Urban respondents have varying levels of concern with a total of 92.6 percentage of urban respondents 48.1 percentage of them strongly agree with the statement and only 1.9 percentage and 7.4 percentage disagree. And rural (small n) respondents have consistently more concern with a total of 5.6 percentage, and majority of 3.7 percentage strongly agree with it. Policy should prioritize visible chargers that are deployed in peri-urban and rural corridors to reduce adoption gaps between those areas and large urban areas.

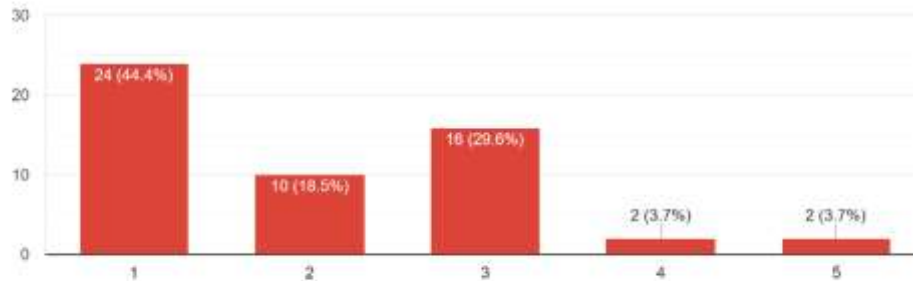
TABLE NO.3 for Rural and semi-urban areas are not yet ready for large-scale EV adoption.

Nativity	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Rural	2 (3.7)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	3 (5.6)
Semi Urban	0 (0.0)	0 (0.0)	1 (1.9)	0 (0.0)	0 (0.0)	1 (1.9)

Urban	22 (40.7)	10 (18.5)	14 (25.9)	2 (3.7)	2 (3.7)	50 (92.6)
Total	24 (44.4)	10 (18.5)	16 (29.6)	2 (3.7)	2 (3.7)	54 (100.0)

Source: Primary Source

5. Rural and semi-urban areas are not yet ready for large-scale EV adoption.
54 responses



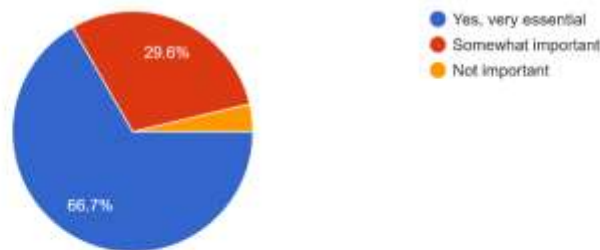
The majority of participants indicated moderate to strong agreement that rural communities are not prepared with urban respondents 40.7 strongly agree and 3.7 strongly disagree. Rural respondents strongly agree the statement with 3.7 percentage and Semi- Urban stays neutral with 1.9 percent. A gender breakdown shows male and female respondents exhibited similar levels of concern, while the rural (small) subgroup indicated relatively higher perceived un-readiness than urban respondents.

TABLE NO.4 for Do you think government subsidies and tax benefits are essential for EV adoption?

Gender	Not important	Somewhat important	Yes, very essential	Total
Female	1 (1.9)	11 (20.4)	17 (31.5)	29 (53.7)
Male	1 (1.9)	5 (9.3)	19 (35.2)	25 (46.3)
Transgender	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	2 (3.7)	16 (29.6)	36 (66.7)	54 (100.0)

Source: Primary Source

7. Do you think government subsidies and tax benefits are essential for EV adoption?
54 responses



Two-thirds say that they believe subsidies are "very essential," i.e., 66.7 percent and 29.6 percentage of them say somewhat important, indicating that price or TCO (total cost of ownership) interventions are still political and socially important tools.

Testing of Hypotheses:

H1 Effective government policies combined with robust charging infrastructure significantly influence the adoption of Electric Vehicles (EVs) in India. The primary data source from Tables 2 and 4 shows that the government incentives, along with infrastructural development, there would be a great change in the usage of EVs among the people, but both factors are yet to develop in India. Total of 59.7 percent of them agree that infrastructure is a great obstacle in Table no.2, and 66.7 percentage of respondents in Table no.4 think that government subsidies still play a vital role. Thus, the thesis is accepted, and it is the null hypothesis

H2 Consumer awareness, affordability, and perceived environmental benefits have a positive and direct impact on the willingness of Indian consumers to adopt Electric Vehicles.

The primary data from Table no. 1 and 3 shows that the people are aware of that the EVs help in sustainable development, fulfilling the SDGs. The awareness of people according to Table no.1, with comparison of gender a total 40.7 percentage are aware and 5.6 are not so sure about it. While looking into Table no. 3. the rural population is still not ready to afford and perceive the environmental benefits. A total of 44.4 percentage of respondents agree with that. Due to some factors like literacy, lack of incentives, and lack of infrastructure rural population faces difficulties, but this is not seen in the case of the urban population.

11. CONCLUSION

India's shift towards Electric Vehicles (EVs) entails not only a technical change but also a critical pathway to wider targets of sustainability. Studies by NITI Aayog (2017) and IEA (2023) indicate that widespread adoption of EVs could significantly lower fossil fuel consumption in cities and improve urban air quality, and reduce carbon emissions. The bulk of government support, such as the FAME scheme and the National Electric Mobility Mission, has acted as incubators in shaping this marketplace. Specific barriers remain, such as initial purchase price, insufficient charging infrastructure, low awareness levels of consumers, and disposal challenges of sustainable storage devices. From a doctrinal perspective, this study shows that the implementation of EV and the sustainability agenda relate to principles of environmental protection, intergenerational equity, and economic efficiency principles as shown by previous judgements on sustainability development as part of the public trust doctrine and the states duty to create an enabling regulatory framework in pursuing this objective refers to EVs and the promotion of cleaner alternatives.

To conclude, the study shows that the promise of sustainability through EVs necessitates an integrated policy agenda focused on infrastructure, energy sourcing, and circular-economy measures.

Suggestions:

1. Enhance Charging Infrastructure: Have affordable, fast-charging stations that are planned and maintained to be found widely in urban and rural settings to increase consumer confidence.
2. Integrate with Renewable Energy: Promote solar-charging stations and renewable energy initiatives, thus shifting the liability of pollution away from operating charging stations to power generation plants.
3. Offer Research & Innovation Support: Create support for research and development related to battery technology, recycling batteries, and creating more energy-efficient batteries to help produce more sustainable electric vehicles.
4. Policy Stability: Keep consistent policies over an extended period of time, and consistent tax benefits to help assure future investment plans and consumers when mechanisms are in place that are long-term.
5. Expand Benefits to Rural Consumers: Allow benefits for electric vehicles beyond urban consumerism to include rural purposes for transport vehicles and agriculture-related mobility.

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