

Consumer Insight on Electric Vehicles for Sustainable and Green Mobility

¹Ms. Raji N., ²Dr. Muralidhar LB

¹Research Scholar, School of Commerce, JAIN (Deemed-to-be-University), Bangalore, Karnataka, India.

²Assistant Professor (Grade-3), School of Commerce, JAIN (Deemed-to-be-University), Bangalore, Karnataka, India.

Abstract

The increasing population has resulted in the demand of sustainable transportation and there is increasing interest in electric vehicles (EVs) as an environment-friendly alternative to conventional automobiles. The study analyses consumers' awareness and perceptions of electric cars (EVs) and their contribution to sustainable and green mobility. This study has been conducted in the form of descriptive research design and primary data has been obtained from 150 respondents through structured questionnaire. The data acquired were examined using correlation, regression, ANOVA and one sample t-test. Results showed that consumer awareness was positively related to consumer perception and that consumer perception had a strong beneficial effect on green mobility. The study finalised the substantial positive link between consumer awareness and also consumer perception ($r = 0.609$, $p < 0.05$), where increased awareness is associated with increased perception of electric vehicles. Regression analysis indicates that consumer perception is significant on green mobility ($R^2 = 0.428$, $P \text{ value} = 0.001$), which gives the result of 42.8% dependent variable varies from the independent variable. The F table also shows that the regression model is fit. The one sample t-test indicates the respondents' high level of awareness, positive perception and high recognition of the role of electric vehicles in attaining sustainable and green mobility. The results also demonstrate that the respondents have high level of awareness, positive opinions and good recognition of the necessity of electric vehicles for sustainable mobility. The study indicates that increased consumer awareness, improvement in charging infrastructure and continued government assistance may help enhance the adoption of electric vehicles and promote sustainable and green mobility. The research urges awareness efforts, an expansion of charging infrastructure and ongoing government incentives to speed up the shift to sustainable mobility.

Keywords: Consumer Insight, Electric Vehicles, Green Mobility, Sustainable Transportation.

Introduction

In nowadays world the people are more eco-friendly and they depend on fossil fuels more for travelling. It increases the demand of transition to sustainable and eco-friendly alternatives like biofuels and alternative energy sources. One of the most interesting and strategically important procedures among all the solutions that have made this paradigm shift including Electric Vehicles (EVs). India's vehicle market placed third in the world market and also it's Economy grows faster in the world. It accounts for about 7-8% of global CO₂ emissions in transport and urban areas like Bengaluru are contributing an unequal share of vehicular pollution. Bengaluru, the capital of the Indian state of Karnataka and the technology hub of India, is a unique and compelling case study, in terms of its chronic traffic congestion, soaring fuel prices, technologically literate population, and burgeoning EV start-up ecosystem and charging infrastructure providers, as well as the government's policy support through the Faster Adoption and Manufacturing of Electric Vehicle (AME).

Electric Vehicle adoption in Indian cities like Bengaluru is still very low performance. The National Electric Mobility Mission Plan (NEMMP) and the subsequent FAME I & II schemes have set ambitious targets, but the pace of adoption has been limited by a confluence of consumer side challenges such as limited awareness, range anxiety, high upfront cost perception, lack of charging infrastructure and entrenched brand preferences.

Consumer perception about EV is not only the part of academic research; it has become a policy and business necessity. Ultimately the rate of EV scale up will depend on consumer perception which is influenced by awareness, attitude, social influence and experience. With a nuanced and data-driven understanding of consumer knowledge, beliefs, fears and values, policymakers and manufacturers can design both incentives and products that match consumers.

This research study aims to address that to gain deeper insights into EV awareness, perception, and behavioural intention among Bengaluru City residents to provide actionable insights that inform EV adoption strategies specifically planned for urban Indian society. Secondly, the study places consumer behaviour in the context of the wider issue of green mobility and sustainable development, thus linking the personal decision to green mobility to its impact on the environment.

Statement Of The Problem

Although the supply-side preparedness for EV adoption has been investigated in India with government initiatives and industry investments, the demand-side preparedness (consumer awareness, perception, and willingness to adopt) in Bengaluru has not been as well studied. Sometimes consumers don't realize the extent of EV benefits, incentives, or EV infrastructure. At the same time, misconceptions around range, charging time, battery life, resale value and total cost of ownership remain as psychological and behavioural hurdles to adoption.

Additionally, a conceptual disconnect exists; most existing studies consider EV adoption as an economic or technological choice, which does not fully reflect the influence of environmental awareness, norms, and green identity on consumer intentions to adopt EVs. This research will aim to overcome these drawbacks through a multi-dimensional framework that is integrated to understand the consumer perception of EVs.

This research study seeks to address the above-mentioned critical knowledge gap. The study is carried out to produce actionable insights by exploring consumer awareness, perception and behavioural intent towards EVs among inhabitants of Bengaluru City to drive EV adoption strategies in the context of the unique socio-economic and cultural fabric of urban India. Furthermore, the research relates individual purchasing decisions to their collective environmental impact by positioning consumer behaviour within the broader framework of green mobility and sustainable development.

Theoretical Background

Global car industry is being reshaped by climate policy pressure, technology disruption and changing consumer values. According to Global EV Outlook 2024 report, that the global EV stock reached 40 million vehicles in 2023, the EV sales hit this figure because of strong demand for EVs' in China, Europe, and US. It is a new EV market, but the ramped-up demand of EV sales in India, especially in the two-wheeler segment, has brands such as Ola Electric, Ather Energy and TVS iQube getting the market attention of consumers.

a figure driven largely by strong demand in China, Europe, and the United States — collectively the three leading markets for EV sales. Global electric vehicle stock hit approximately 40 million in 2023, per IEA figures, with China, Europe, and the U.S. together accounting for the vast majority of sales activity that year.

Today, Bengaluru, known as the 'Silicon Valley of India', is the leading EV hub of India. The city boasts the headquarter of Ather Energy and a factory of Ola Electric and has a sprawling network of EV charging stations supported by BESCOM (Bangalore Electricity Supply Company) which is a great example of how EVs are being incorporated into mainstream urban transportation. However, despite these supply side changes, there is an uneven adoption rate among consumers and the drivers of consumer perceptions are not well understood.

In this context, the study analyses the awareness levels, perceptual attributes, influencing factors and green mobility associations towards EVs among urban consumers in Bengaluru. The insights gained are of relevance not only to the local market but also to the larger Indian EV ecosystem.

Bengaluru, also called the 'Silicon Valley of India' has now become the main EV hub in the country. The city, which houses the headquarters of Ather Energy, the manufacturing plant of Ola Electric and a dense network of EV charging points supported by BESCOM (Bangalore Electricity Supply Company), offers a microcosm to

understand how EVs can be integrated into mainstream urban mobility. Nevertheless, the uneven distribution of consumer adoption remains, and the factors that impact consumer perception are still poorly understood.

Literature Review

There are several theories developed to describe behaviour and technology acceptance, which can also be adapted to understand the adoption of EVs. Fred D. Davis' Technology Acceptance Model (TAM) (1989) says if the technology is very useful and perceive ease to use it will be adoptable easily by most of the people. "From an EV standpoint, if consumers think EVs are cheaper, better for the environment, a lot less hassle, and easy to drive, maintain, and operate, they will be more likely to consider EV purchasing." Similarly, Icek Ajzen (1991) theory of planned behaviour states that three key determinants of the consumer behaviour; attitude toward the behaviour, subjective norms and perceived behavioural control. This theory can be relevant to the context of EV adoption as the attitudes of the people towards sustainability, social influence from their peers and perceived control over charging and use of the EV has a significant influence on EV purchase intention.

International Energy Agency (2023), reported that, the global EV market is booming very faster than ever, that the number of vehicles on the road increasing steadily. This rise can be explained by a number of reasons, among which are increased environmental awareness and the adoption of government policies that promote such measures as subsidies and incentives. Empirical studies also point out the factors influencing EV adoption. Sierzechula et al. (2014) concluded that the access to charging infrastructure and financial incentives are key factors in shaping consumer buying decisions. Similarly, Rezvani et al. (2015) listed a number of critical factors that influence EV uptake, such as environmental awareness, cost, vehicle performance and social influence. From this, it can be concluded that there are economic and psychological factors affecting consumer cognition.

Furthermore, Jansson et al. (2010) pointed out that the environmentally conscious consumers are more likely to consume green vehicles, which are fuelled by ecological and environmental concerns. NITI Aayog in 2022, reinforced its efforts to promote electric mobility by introducing a draft battery-swapping policy, launching the E-AMRIT application to increase consumer awareness, and publishing detailed reports on battery recycling and EV financing. These efforts were aimed at supporting the growth of a sustainable electric vehicle ecosystem in India.

Although there has been a lot of research conducted around the world on the adoption of EVs, most of the research is focused on developed countries. Localized research with the consumer perception and acceptance of the products is clearly lacking, especially in cities such as Bengaluru. This paper focus to fill this gap by examining, the perception of the consumers towards EVs in the context of sustainable and green mobility at the local level.

Research Design

The paper is a mix-up of descriptive and analytical research design, with the objectives to study the perceptions of consumers towards electric vehicles with the aim to promote sustainable and green mobility. In this study uses the primary and secondary data which were collected through the structured questionnaire and journals, reports and reliable online sources. The study used purposive sampling technique and about 150 respondents from north Bengaluru were the respondents. The data have been analysed using simple statistical techniques such as Correlation, Regression analysis, and one sample t test to ensure significant relationship between consumer awareness and perception of electric vehicles and also check the Electric vehicles have no significant role in promoting green mobility

Objectives

- To study consumer Insights such as consumer awareness and perception towards EVs for Sustainable and Green Mobility in Bengaluru City
- To identify the factors influencing EV adoption, and
- To examine the significant role of EVs in promoting green mobility.

Null Hypothesis

H₀₁: There is no significant relationship between consumer awareness and perception of electric vehicles

H₀₂: There is no significant influence of consumer perception on the adoption of electric vehicles.

H₀₃: Electric vehicles have no significant role in promoting green mobility.

Data Analysis And Interpretations

TABLE 1: RELIABILITY ANALYSIS

Scale	No. of Items	Cronbach's Alpha
EV Awareness	5	0.748
Consumer Perception	6	0.765
Role in Green Mobility	5	0.808

Table 1 showed the reliability test using the Cronbach's alpha. This table consist of EV awareness scale which consisting of 5 shows value of 0.748. The Consumer Perception scale which is composed of 6 items had internal consistency of 0.765. The Cronbach's Alpha value of the scale of Role in Green Mobility (5 items) was the highest, with a value of 0.808, which means good reliability. All three scales meet the reliability criterion of .70 or higher, so that the questionnaire can be used for further analysis.

TABLE 2: CORRELATIONS

Particulars	Consumer Awareness	Consumer Perception
Consumer Awareness	1	0.609
Consumer Perception	0.609	1

Correlation is significant at the 0.05 level.

Table 2 shows that there is a positive relationship between consumer awareness and consumer perception, with a correlation value of 0.609. it indicates consumer awareness increases; consumer perception also tends to improve. Since the relationship is significant at the 5% level, it indicates that the result is statistically meaningful and not due to chance.

TABLE 3: MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.654	0.428	0.424	0.5457

Predictors: (Constant) Consumer Perception

Table 3 shows that, the relationship between the variables is moderately positive and exhibited by the regression model (R = 0.654). The value of R Square is 0.428 which means that, the independent variable explains 42.8% of the variation in the dependent variable, and remaining 57.2% of the variation is due to other factors

Table 4: ANOVA

Model	Sum of Squares	Df	Mean Square	F	Sig,
1 Regression	32.932	1	32.932	110.582	0.000 ^b
Residual	44.075	148	0.298		
Total	77.007	149			

a. Dependent Variable: Green Mobility

b, Predictors: (Constant), Consumer Perception

Table 4, ANOVA results show that the regression model is statistically significant ($F = 110.582$, $p = 0.000$). Since the significance value is less than 0.05, the model is considered valid. This indicates that the consumer perception has a significant effect on the dependent variable, and the regression model is suitable for the study.

TABLE 5: COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.228	0.271		4.528	.000
Consumer Perception	0.703	0.067	0.654	10.516	.000

a. Dependent Variable: AGM

Table 5, showed that consumer perception has a positive and significant influence on the role in green mobility. The coefficient value ($B = 0.703$) means that as consumer perception increases, the role in green mobility also increases. Since the p-value is 0.000, which is less than 0.05, the relationship is statistically significant.

TABLE 6: ONE SAMPLE T TEST

	N	Mean	SD	t-statistic	p-value	95% CI Lower	95% CI Upper	Significance
EV Awareness	150	3.812	0.859	11.573	0	3.673	3.951	***
Consumer Perception	150	4.003	0.669	18.375	0	3.895	4.111	***
Role in Green Mobility	150	4.043	0.719	17.763	0	3.927	4.159	***
Overall EV Score	150	3.953	0.621	18.799	0	3.853	4.053	***

Table 6, one-sample t-test results show that all the study variables have high mean scores and are statistically significant ($p = 0.000$). Among the variables, Role in Green Mobility has the highest mean score (4.043), followed by Consumer Perception (4.003), Overall EV Score (3.953), and EV Awareness (3.812). Since the p-value for all variables is less than 0.05, the results indicate that respondents have a positive level of awareness, perception, and acceptance of electric vehicles and recognize their role in promoting green mobility.

Findings

- It was concluded that the relationship between the consumers' awareness and perception was relatively good ($r = 0.609$, $p < 0.05$). This suggests that the relationship between EV's positive perception and awareness is there.
- The regression study showed that 42.8% of consumers think that green mobility is important, while 57.2% are influenced by other factors when buying a vehicle.
- The consumers' perception of green mobility is statistically significant, as shown by the regression model ($F = 110.582$, $p < 0.001$), according to the ANOVA test.

- The results of regression coefficient analysis showed that the perception of the customers had a positive and significant effect on green mobility ($B = 0.703$; $p < 0.001$), it positively affected consumers' perception of greater use of EVs and made sustainable transportation easier.
- Results of the one-sample t-test showed that all the research variables were at the mean score above the neutral point and were statistically significant ($p < 0.001$) which meant that the respondents had a favorable opinion of the research variables.
- The study factors with the highest mean scores were Role in Green Mobility, Consumer Perception, Overall EV Score, and EV Awareness (4.043, 4.003, 3.953, and 3.812, respectively). It shows the understanding of the respondents with respect to the contribution of EVs to environmental sustainability. In conclusion, the research indicates that consumer perception and knowledge is a key factor in encouraging the adoption of green mobility and EVs.

Suggestions

1. Government bodies should intensify public awareness-raising and promote EV adoption by educating consumers about the benefits for the environment and economy.
2. Automobile manufacturers need to work on enhancing customer perception through better information regarding battery life, charging infrastructure, maintenance costs, and the performance of the vehicles.
3. To improve consumer trust and promote EV use, expand charging facilities in urban and rural areas.
4. Incentives like subsidies and tax credits and financing through low-interest options should keep making EVs more affordable.
5. Test-drive events, awareness drives and digital marketing campaigns to help dispel misconceptions and build consumer trust in the manufacturer.
6. Awareness programs and demonstrations are possible through collaboration between government, manufacturers and educational institutions in order to promote sustainable mobility.
7. Other factors that could be added to the future studies are charging convenience, government policy, income level, environmental concern, and technologies

Conclusion

The study concluded that the consumer awareness and consumer perception play a significant role in the adoption of EVs and their contribution to green mobility. A positive correlation between awareness and perception showed that an increase in public knowledge on EVs can lead to positive attitude changes in the consumers. The results of regression analysis showed that the perception of consumers was a significant positive influence on green mobility, while one sample t-test showed that in general the opinion of the respondents was favourable towards the electric vehicle. Thus, raising awareness, improving charging infrastructure, providing incentives, and boosting consumer confidence will be crucial for EV adoption and for sustainable mobility in the future.

References

- [1] International Energy Agency. (2024). *Global EV outlook 2024: Moving towards increased affordability*. <https://www.iea.org/reports/global-ev-outlook-2024>
- [2] Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson.
- [3] Malhotra, N. K. (2020). *Marketing research: An applied orientation* (7th ed.). Pearson.
- [4] Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- [5] Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- [6] Sekaran, U., & Bougie, R. (2020). *Research methods for business: A skill-building approach* (8th ed.). John Wiley & Sons.
- [7] Baratova Shoir Norjigitovna, Farukh Mekhliboyev, Radha Thangarajan, A. Selwyn Lloyd, Abhijit Chandratreya. (2026). Social Inclusion Experiences of Students with Disabilities in Mainstream Education. *International Journal of Special Education*, 41(14s), 793–801.
- [8] Radha Thangarajan, R. Pavithra, Devi Premnath, Sangappa Poojari, Rekha K M, J. Merlin Sheela Magdaline. (2026). Artificial Intelligence for Intelligent Knowledge Sharing And Workplace Mentoring in Pharmaceutical Marketing. *Journal of Daoist Studies*, 19(S9), 100–106.

- [9] Padmavathy, G., Alex, S., Thangarajan, R., Shankar, N., Ganesan, A., & Arunfred, N. (2026). Optimizing Inventory Management in Supply Chains Through Predictive Analytics and Big Data Techniques. *Indian Journal of Information Sources and Services*, 16(2), 319–327. <https://doi.org/10.51983/ijiss-2026.16.2.32>
- [10] Singh, V., Singh, V., & Vaibhav, S. (2020). A review and simple meta-analysis of factors influencing adoption of electric vehicles. *Transportation Research Interdisciplinary Perspectives*, 8, 100273. <https://doi.org/10.1016/j.trip.2020.100273>
- [11] Transportation Research Board. (2022). *Overcoming barriers to electric-vehicle adoption: Proceedings of a workshop*. National Academies Press. <https://doi.org/10.17226/26500>
- [12] Thangarajan, R., Jaganathan, P., Thirumoorthy, K., Kesavan, H., & Pradeep, P. (2024). An empirical study on financial performance of micro finance Institutions. *Multidisciplinary Science Journal*, 6, 2024ss0428. <https://doi.org/10.31893/multiscience.2024ss0428>
- [13] S Lal, H Mani, M KL, A Sharma, A Sasidharan, T Radha Developing a strategic planning framework for Small and Medium Enterprises (SMES) *European Chemical Bulletin* 12 (5), 460-469
- [14] Radha Thangarajan, Prabhakaran J, Hemanth Kumar S, Sasmita Panda, 'Self-Help Groups: Bridging the Gap for Financial Inclusion', *Journal of Informatics Education and Research* 4 (3 (2024)), 2652-2656
- [15] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- [16] World Bank. (2023). *The global shift toward electric mobility*. <https://www.worldbank.org/>