J Euro Eco His.
ISSN : 0391-5115
Volume 7, Isue 2 (2026)
THE JOURNAL OF EUROPEAN ECONOMIC HISTORY

Rural Consumers affinity towards Electric Cars: A critical Study of Consumer Perception with special reference to Pune District.

Vidya Nakhate
Director, Sterling Institute of Management Studies

D. Kumar
Associate Professor, IIMS

Shweta Vyas
Assistant Professor, Indira University

Mrityunjay Kumar
Assistant Professor, Indira University

Sadaf Karim
Assistant Professor, Independent Resercher

Shital Bhusare
Associate Professor, SIBMT

Abstract
India has been a huge market for automobiles especially cars due to the increased per capita income. Over the years, there has been transition from one set of fuel based cars to other set of fuel based cars. In the recent years, the GOI initiatives to encourage clean energy cars have widened the automobile sector. The researchers through this research paper have tried to understand the perception of rural consumers and the different forces influencing it. The study has been done in case of rural areas of Pune district. Less Awareness of the product, related infrastructure such as charging stations, absence of suitable private parking spaces with electricity connection and affordability of the consumers are driving factors behind low sales volume.

Key words: Electric, cars, rural, consumers, perception

I. Introduction

The concern for environment and climate change has increased amongst all the stakeholders of the society, be it the government, the civic society, the corporates, and the common people. The companies have also realized this, and marketers are trying to influence customers through their sustainable practices. There are different companies today which are largely associating their brands with sustainable practices and attributes. The GOI commitment towards zero degree emission has encouraged the business leaders to come out with the products which are environmental friendly. The Automobile companies considering the emerging need started experimenting with electric vehicles. This may reduce the India's dependence on traditional crude oil further reducing the import bill. India's economic growth on an average has been more than 6.5% and hence this will increase the consumption demand of private vehicles. This may hamper the government commitment towards emission reduction. Hence the government is giving financial incentives to the company's manufacturing electric vehicles so as to encourage the consumers to buy. But in spite of the efforts the increase in sales of electric vehicles are not encouraging. Thus under such environment the researcher want to study the consumer perception of rural consumers towards electric cars with reference to Pune district. The researchers have tried to understand

the different factors such as acceptability, affordability, accessibility and awareness (4A's) and their impact on buying behavior of rural consumers.

II. Literature Review

Mittal, G., Garg, A., & Pareek, K. (2024) have examined how Indian consumers' perceptions of EVs are influenced by many aspects, including cost, news, after-sales services, and social perspectives. The study places a strong emphasis on how branding and favorable media representation influence consumer perception. The two main drawbacks for Indian buyers of EVs are their short driving range and expensive initial costs. Carrel Sharel Pereira & K. Shivashankar Bhat (2024) reveals that consumer perception and purchasing behavior towards EVs are influenced by a complex interplay of technological, economic, psychological, and social factors. While environmental concerns and government incentives play a significant role in promoting EV adoption, barriers such as high costs, limited range anxiety, and inadequate charging infrastructure remain significant hurdles. Kazemzadeh, K., Bansal, P., & Patil, P. (2023) focuses on consumers' willingness to pay for EVs, indicates that Indian consumers are sensitive to pricing. He looked into how different car features affected what consumers preferred. It is essential to comprehend these elements to design EVs that satisfy the demands of Indian consumers. Rafiq, F., Parthiban et al. (2023) investigated the transition from fossil-fuel vehicles to electric vehicles (EVs) which represents a significant stride towards environmental conservation within the automobile industry. The industry demonstrates a commitment to aligning with evolving consumer preferences for sustainability, evident in the proliferation of eco-friendly vehicle options across various price points. Notably, EVs offer financial incentives and tax benefits, contributing to their increasing demand and profitability compared to traditional fossil-fuel variants. However, post-purchase environmental impacts remain a concern, with the automotive sector implicated in resource depletion, carbon emissions, and non-biodegradable waste generation. Fanchao Liao et al. (2016) has reviews different types of literature regarding electric vehicles. Their study represents a comprehensive review of consumer preferences towards electric vehicles. The authors have categorically defined influential factors for consumer preferences such as socio economic variables, psychological factors, mobility condition, social influence etc. Kathrin M Buhmann & Joseph R Criado (2023) have studied the role of status, reputation in consumer's preferences for electric vehicles. The authors have focused that consumers who are more reputation conscious prefer electric vehicles when the purchase price is more expensive than that of other vehicles. It is found that age, being male, having children, education, living in urban areas, and previous experience positively influence EV adoption. John Robin Uy et al. (2024) have studied the marketing strategy and preference analysis of electric cars in a developing country. The findings of the study determined that cost is the primary concern for consumers by a considerable margin; followed by battery type and charging method; along with the type of EV, driving range, and charging speed; and most minor concern is regenerative brakes. Therefore, there is an apparent sensitivity to price and technology. The results suggest that a targeted effort to overcome cost barriers and improve technological literacy among prospective buyers should be productive for speeding up EV adoption in the Philippines. M. Patil et al. (2021) in their study have focused upon prospective users' choice decision towards electric 2 wheelers using a stated preference survey. The different attributes considered are operating cost savings, top speed, range, charging duration, acceleration, and purchase cost etc. Besides, the impact of different socio economic characteristics was also considered. The findings revealed that top speed was perceived as the most important attribute influencing an individual's choice decision, followed by acceleration and charging duration. Age, income, and journey time

significantly influenced an individual's perception toward E2W and related attributes in the Indian context.

Research Gap

After going through different literatures, the researcher found that there has been only few research works being done regarding electric cars especially in Indian context. There is a huge research gap as far as understanding consumer preferences rural consumers towards electric cars is concerned. The existing study has only been done in context of urban areas neglecting the preferences of rural consumers.

III. Research Methodology

a) Research Questions

Q.1. What attributes do rural consumers prefer when they choose among specific Electric vehicles?
Q.2. To what extent do these preferences show heterogeneity? What factors may account for heterogeneity?

b) Problem Statement

Considering the increase in emission level in most of the cities, the researcher tries to find out the consumer preferences towards electric cars. The consumer perception will help the manufacturer and marketer to customize the products so as to match the customer expectations as the sales are not peaking up in spite of government giving subsidy. Hence the researcher has tried to understand the comprehensive views of rural consumers regarding electric cars.

c) Objectives of the Study

1. To study the consumers perceptions about different features of Electric cars.
2. To investigate rural consumers' affordability towards electric cars.

3. To study the different determinants impacting the sales of electric cars amongst rural consumers.

4. To study the reasons behind heterogeneity in consumer preferences towards electric cars if any.

d) Research Design, Data collection, Sampling and Tools of Analysis

The research design for the study will be descriptive as the study will be done from different stakeholder's point of view i.e. the consumer tastes and preferences, the government policies, manufacturers' point of view etc. The study is descriptive as most of the dimensions already exist at present. The study will be based on primary as well as secondary data. The primary data will be collected through a structured questionnaire from 250 respondents from rural consumers from Pune district. Secondary data will be acquired by articles published on websites, magazine, newspaper and research papers published in diverse academic journals etc. The sampling design will be simple random sampling. The various statistical tools such as

Excel, SPSS 21 will be used in order to derive the results.

e) Hypothesis of the Study

1. There is association between educational level of the consumers and their preference for Electric cars.
2. Petrol/diesel cars in India have more offerings to the rural consumers as compared to Electric cars.
3. Consumers from Rural areas have larger affinity towards Electric cars.
4. Charging Platforms are major challenge in adoptability of electric cars amongst rural consumers.

IV. Data Analysis and Interpretation

a. Variables (Opinion) of the consumers impacting purchase decisions of Electric Cars

Variable	M	SD	Skewness	Kurtosis	Coefficient of Variance
Price	3.60	1.17	-0.525	-0.536	32%
Quantity	3.70	1.14	-0.479	-0.746	30%
Quality	3.74	1.103	-0.511	-0.543	25%
Availability	3.87	1.12	-0.599	-0.566	29%
Income	3.7	1.095	-0.431	-0.63	29%
Cost of battery replacement	4.1	1.01	-0.499	-0.52	24%
Charging stations	3.9	1.09	-0.502	-0.504	26%
No Dealers nearby	3.92	1.12	-0.473	-0.482	28%
Low awareness about the attributes of the electric cars	4.01	1.11	-0.503	-0.504	27%
Education/Information	3.7	1.05	-0.452	-0.592	29%

Table no.1: Respondents Opinion towards purchase decisions of electric cars

Observation: Since coefficient of variance, in case of all the variables is less than 33%. So, there is a less disparity in data. "Mean" can be meaningfully interpreted. Skewness is a "Negative "value. The curve is left skewed, data are piled up on the right. Since kurtosis is negative the curve is short and flat. "Skewness" and "Kurtosis" also supports the "MEAN". Hence most of the respondents agree that the above mentioned variables impact purchase decisions of the electric cars.

b. Factors affecting purchase decisions of Electric cars by Rural consumers

S. no.	Variables	Mean Rank
1	Awareness about the government subsidies	5.71
2	Rural consumers are more price sensitive	5.93
3	Not sure about the durability of the batteries	5.41

4	Charging stations	5.81
5	Education about its positive impact on environment	5.08
6	Promotional activities by existing players	5.82
7	Cost of battery replacement	4.55
8	Awareness about the basic attributes of electric cars	5.11
9	Load carrying capacity	4.13

Table no.2: Non parametric Friedman test depicting mean rank of different variables

Observations: The Friedman test is used to compare the mean ranks between the related groups and show how the different variables differ based on the value of mean ranks. Based on the above table, it can be observed that rural consumers are more price sensitive has a highest mean rank of 5.93, followed by promotional activities by marketers having mean rank of 5.82, Unavailability of charging stations having a mean rank of 5.81. Hence most of the respondents perceive these factors to be of highest degree in assessment of sustainable brands. Load carrying capacity and cost of battery replacement has the lowest mean ranks, which shows that most of the respondents give least significance to it in assessment of Electric cars..

Test Statistics	
N	248
Chi-Square	73.550
df	9
Asymp. Sig.	.000
a. Friedman Test (Significance level 5%)	

Table no.3: Test Statistics

Interpretation: The above table provides the value of Chi square, degree of freedom and the significance level. The value of P (.000) is less than the level of significance and hence the null hypothesis is rejected. Thus there lies differences between the mean ranks of the above given parameters.

c. Petrol/diesel cars in India have more offerings to the rural consumers as compared to Electric cars.

Statistical Test; paired sample T- Test, Level of significances - $\alpha = 0.05$.
Respondents were requested to compare Petrol/diesel cars and Electric cars on the basis following parameters using 5 points Likert Scale: Strongly Agree, Agree, Neither Agree nor Disagree, Agree, Strongly Agree.
Parameters are: Acceptability (Whether product meet customer needs and values better than the alternatives), Affordability, Accessibility and Awareness (4A'a)
Ho: Petrol/Diesel cars and Electric cars do not differing in offerings to the rural consumers [$\mu d \leq 0$].
H1: Petrol/Diesel cars and Electric cars differ in offerings to the rural consumers. [$\mu d > 0$]

J Euro Eco His.
ISSN : 0391-5115
Volume 7, Issue 2 (2026)
THE JOURNAL OF EUROPEAN ECONOMIC HISTORY

i.) Acceptability

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Dev.	Std. Error Mean			
Pair 1	Acceptability	0.812	1.754	0.105	7.495	248	P<0.001

Table no.3: Paired Samples Test

Paired Sample Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Acceptability (Petrol/Diesel cars)	3.82	249	1.036	.056
Acceptability (Electric Cars)	3.01	249	1.345	.073

Table no. 4: paired sample Test: Acceptability

Petrol/Diesel cars mean = 3.82, Electric cars mean = 3.01, T value = 7.49, P Value < 0.05
Hence the null hypothesis is "rejected" & from the above mean value it is concluded that petrol/Diesel cars are more "acceptable" than Electric cars.

ii) Affordability

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Affordability	0.765	1.6	0.097	8.056	248	P<0.001

Table no.5: Paired Samples Test

Paired Samples Statistics

Pair 1		Mean	N	Std. Dev.	Std. Error Mean
	Affordability (Petrol/Diesel Cars)	4.30	249	1.021	.064
	Affordability (Electric Cars)	3.51	249	1.450	.082

Table no. 6: Paired sample Test: Affordability

Petrol/Diesel Cars mean = 4.30, Electric Cars mean = 3.51, T value = 8.056, P Value < 0.05
Hence the null hypothesis is "rejected" & from the above mean value it is concluded that Petrol/Diesel cars are more affordable to rural consumers as compared to Electric cars.

iii) Accessibility

Paired Samples Test			
Paired Differences	T	Df	Sig. (2-tailed)

Mean	Std. Deviation	Std. Error Mean			
0.659	1.737	0.097	5.826	248	P<0.001

Table no. 7: Paired Samples Test

Paired Samples Statistics

Pair 1		Mean	N	Std. Dev.	Std. Error Mean
	Accessibility (Petrol/Disesel Cars)	3.89	248	0.905	0.051
	Accessibility (Electric Cars)	3.18	248	1.27	0.069

Table no. 8: Paired Samples Test Accessibility

Petrol/Diesel Cars mean = 3.95, National brands mean = 3.28, T value = 6.826, P Value < 0.05
Hence the null hypothesis is "rejected" & from the above mean value it is concluded that Petrol/Diesel cars are more accessible to rural consumers as compared to Electric cars.

iv) Awareness

Paired Samples Test							
		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Awareness	0.564	1.649	0.091	6.196	248	P<0.001

Table no. 9: Paired Samples Test

Paired Samples Statistics

Pair 1		Mean	N	Std. Dev.	Std. Error Mean
	Awareness (Private/Diesel cars)	4.13	248	1.041	0.057
	Awareness (Electric Cars)	3.61	248	1.442	0.063

Table no. 10: Paired Samples Test (Awareness)

Petrol/Diesel Cars mean = 4.13, Electric Cars mean = 3.61, T value = 6.196, P Value < 0.05
Hence the null hypothesis is "rejected" & from the above mean value it is concluded that rural consumers are more aware about Petrol /Diesel cars as compared to Electric cars.
Considering all the four variables, we can say that petrol/diesel cars have more offerings to rural consumers as compared to Electric cars in terms of Acceptability, Affordability, Accessibility and Awareness.

IV. Need and Significance of the Study

The findings of the study will help different manufacturer of electric cars to formulate effective

marketing strategy (Product, Price, Place and promotion). The Electric cars makers must contribute towards accessibility, acceptability, affordability and awareness so as to increase the sales volume in rural areas. The government may also formulate significant changes in its policies regarding electric cars based on consumer preferences. The promotion of more environment friendly vehicles will help the government in attaining its target of zero emissions. The study will also help in understanding the opinion of consumers from Gen X, Y and Gen Z as well as urban consumers regarding electric mobility.

V. Limitations and Future Scope of the Study

The researchers have studied the subject of environmentally sustainable Electric cars based only on selected parameters. The study is only limited to selected consumers from Rural consumers of Pune district, Maharashtra, India. The researchers' perception regarding Electric cars may differ to certain extent than respondents. The study can be taken forward in case of larger sample size covering larger geographical area. The findings of the research will help the future researchers to carry out research study on the subject of study covering larger geography and population. The findings of the study can be extended and applied in case of CNG blend or ethanol blend vehicles as well.

VII. References

1. https://evreporter.com/indias-electric-vehicle-sales-trend-august-2024/
2. Liao, F., Molin, E., & van Wee, B. (2016). Consumer preferences for electric vehicles: a literature review. Transport Reviews, 37(3), 252–275. Available Online at https://doi.org/10.1080/01441647.2016.1230794.
3.United Nations Bruntdland commission (1987). Available online: https://www.un.org/en/academic-impact/sustainability (accessed on 26 April 2023).
4. Sustainable Development Goals. Available online: https://sdgs.un.org/goals (accessed on 20th March 2023).

5. Kathrin Monika Buhmann, Josep Rialp Criado, Consumers' preferences for electric vehicles: The role of status and reputation, Transportation Research Part D: Transport and Environment, Volume 114, 2023, 103530, ISSN 1361-9209, https://doi.org/10.1016/j.trd.2022.103530.
6. Uy, J. R. R., Ong, A. K. S., & German, J. D. (2024). Marketing Strategy and Preference Analysis of Electric Cars in a Developing Country: A Perspective from the Philippines. *World Electric Vehicle Journal*, *15*(3), 111. https://doi.org/10.3390/wevj15030111.
7.Kakade Akshay; Raut Abhijeet, Sustainable Brands. Available Online: https://www.slideshare.net/AbhijeetRaut13/sustainable-brands-104248731.
8. Richardson Sedgwick, Available Online: https://www.sedgwick-richardson.com/news-insights/the-importance-of-building-sustainable-brands/.
9. Javed Amber (2022); Evaluating brand perception regarding sustainability through digital marketing; Degree Projects at EECS, 2022, KTH Royal Institute of Technology.
10.Economic Survey, 2023-24, GOI, https://www.indiabudget.gov.in/.
11. D. Kumar et. al, Indian Economy, Concepts and Contexts, (2026), first edition, VIS Stata Publications, Pune