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Consumer Perception towards Electric Vehicles in Thrissur District

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***Abstract*— This is a study on consumer perception towards electric vehicles in Thrissur district, Kerala mainly focusing on demographic variables, awareness levels, perceived benefits, and the main barriers to adoption. As there is major emphasis on sustainable mobility in national and global level, EVs are positioned as an alternative for Internal combustion engine vehicles, as it reduces carbon emission, enhanced environmental quality and saving costs. Government has implemented so many policies and incentive schemes such as FAME II subsidies, charging infrastructure roll out under PM E-Drive and state government has initiated electrification initiatives to encourage EV adoption. However, adoption remains uneven, hindered by high upfront cost, range anxiety. This study evaluates demographic correlations with EV perception from a sample of 150 respondents via stratified random sampling, through percentage distribution and chi-square tests. This study contributes insights for policymakers, manufactures and stakeholders of EV.**

***Keywords*—Consumer Perception, Electric vehicles (EVs), Sustainability, Government Incentives, Charging Infrastructure.**

I. Introduction

Global automotive Industry is witnessing a remarkable transition towards sustainable mobility, with electric vehicles (EVs). They are rapidly gaining attention as a sustainable transport system, as it reduces carbon emission, dependence on fossil fuel, environmental degradation. Government has also initiating many policies and incentives to faster the EV adoption such as FAME (Faster Adoption and Manufacturing of Electric vehicles), PM E-DRIVE scheme for supporting charging infrastructure, subsidies and market incentives. (keralaenergy.gov.in) Above all these factors consumer perception and awareness remains crucial determinants of adoption of EVs especially in a semi urban area like Thrissur district in Kerala.

Consumer perception includes attitudes, beliefs, and preferences towards EVs and is also influenced by economic, social, and technological factors, including consciousness on environment, cost savings, charging accessibility and perceived performance.

The national and state level policies reduce barriers to the adoption of EVs. (cahiersmagellanes.com) understanding the local perceptions allows valuable insight for targeted promotion strategies, making this study important for policymakers, stakeholders who are seeking to enhance EV adoption in Thrissur district.

II. Scope Of Study

This study focuses on consumers above age of 18 residing in Thrissur district, assessing perception towards EVs in terms of benefits, barriers and influencers. It also analyse the awareness of government incentives, charging infrastructure, perceptions and demographic correlations, laying ground work for future policy and marketing startegies.

III. Significance Of Study

Understanding of consumer perception of EVs is crucial for their wider adoption. This study provides valuable insights into the factors influencing consumer attitude towards EVs, by identifying different factors policymakers, manufactures and marketers can develop strategies to address concerns and promote EVs. Improving consumer perception of EVs accelerates the transition to a more eco-friendly and sustainable transportation system, benefiting both society and planet.

IV. Objectives Of Study

1. To analyse the influence of age on consumer perception towards EV adoption.
2. To assess how income level affects awareness and attitude towards EVs.
3. To evaluate the impact of education on perceived benefits and barriers to adoption of EVs.
4. To determine gender differences in perception toward EV benefits and infrastructure readiness.

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V. Conceptual Framework Of Study

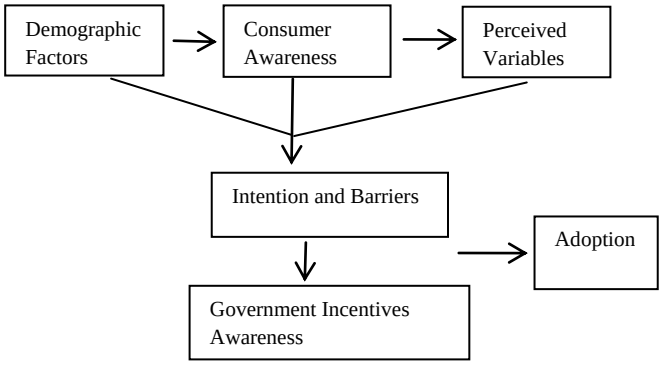

Figure 1 : Pathway Showing relation of variables

VI. Research Design

This study uses a descriptive research design with quantitative approach. Data collected through structured questionnaire from residents of Thrissur district aged 18 and above. Total of 150 responses collected, stratified random sampling method is adopted based on age, gender and income strata.

VII. Hypothesis

H_0 : There is no significant association between demographic variables (age, income, education, gender) and consumer perception towards EVs.

H_1 : There is significant association between demographic variables and consumer perception towards EVs.

VIII. Review Of Literature

Adithya Kumar(2023), He examined consumer perception towards electric vehicles in India. As per his study the survey participants are conscious of global climate issues and they are willing to transfer from traditional vehicles to electric vehicles. The cost is the most crucial factor in the adoption. This study highlights the limited resources of fossil fuel lead India to move towards the adoption of EV. The government has provided several incentives for promoting the adoption.

Hafize Nurgul Durmus Senyapar, Akil Murat (2023), Analysis of consumer behaviour towards electric vehicles: Intentions, concerns and policies. Acceptance of EV in developed nations, strategies for market expansion in developing countries like Turkey are explored.

This study examines global EV ploicies, consumer concerns and intention using behavioural theories. It suggests Industry and researcher recommendations for increasing EV market share and reducing carbon footprints.

Tanay Patodia, Shaunak Roy(2023) , Understanding Consumer perceptions and purchase intentions of Electric Vehicles : An In-depth analysis. This research covers purchase behaviour and usage intentions. Government can enhance adoption with toll exemption, charging access and incentives. The role of Government in infrastructure, policies, subsidies and incentives are crucial for promoting EV sales.

IX. Theoretical Framework

Electric Vehicles are the major alternative for Internal Combustion engine vehicles. They leverage rechargeable battery systems to deliver transportation system with reduced emissions and with low maintenance cost. Consumer perception play a vital role in adoption as positive attitude of consumers correlate with willingness to purchase. Perception includes psychological elements like beliefs about environmental impact, cost benefit considerations, subjective opinion on EV performance and convenience. Researches highlight that environmental awareness and cost savings are the key drivers in consumer perception of EVs.

There are several incentives and policies offered by Indian Government for supporting the adoption of EVs. Central government Introduced FAME II scheme (Faster Adoption and Manufacturing of Electric vehicles) which provides subsidies ranging from ₹ 10,000–₹ 15,000 per kWh depending on vehicle type , aiming at lowering upfront cost and stimulating demand.(keralaenergy.gov.in) The PM E-DRIVE scheme allocates significant funds to support EV infrastructure including subsidies for charging stations and public private partnership to strengthen EV ecosystem.(mathrubhumi) In Kerala state level, incentives are there under Sate EV policy encouraging charging stations with fiscal support and additional incentive programs for EV start-ups. These incentives are are designed to reduce critical adoption barriers like high purchase price and limited infrastructure. Consumer awareness on these programs varies widely.

Charging infrastructure in one of the key barrier for the adoption of EVs. Home charging offers convenience for many but public charging networks remain sparse outside urban areas. Kerala recently mapped 340 sites for EV charging under PM E-DRIVE scheme representing a key step towards infrastucture expansion.

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Socio-Demographic variables such as age, income, education, gender shape consumer perception. Younger and educated consumers will exhibit more environmental consciousness and adoption of new technological innovations. Higher Income also relates to willingness to accept as it overcome cost barriers. As these variables modulate acceptance levels also by influencing government incentives.

X. Data Analysis

1. Analysis of Key Variables

TABLE I
ANALYSIS OF KEY VARIABLES

Variable	Favorable perception	Unfavorable	Neutral
Overall EV perception	48	32	20
Awareness of Incentives	36	50	14
Charging Infrastructure Satisfaction	28	52	20

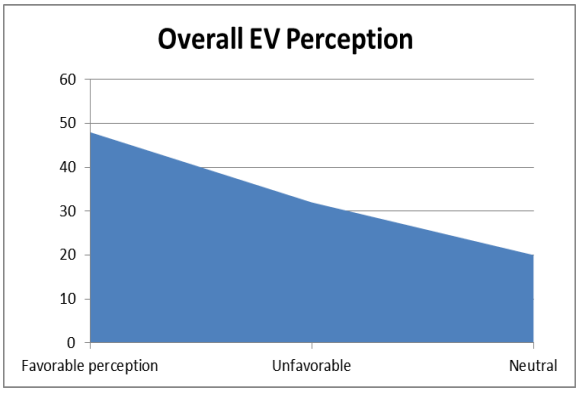

Figure 2: Overall EV perception among Consumers

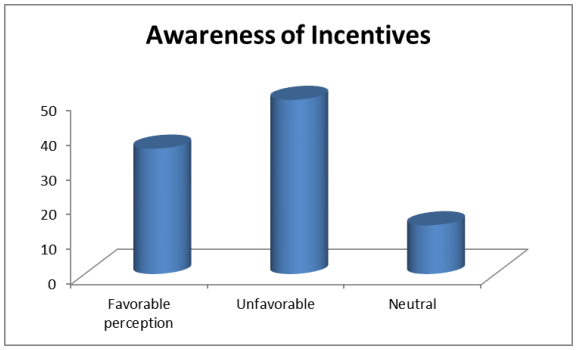

Figure 3: Awareness of Incentives among Consumers

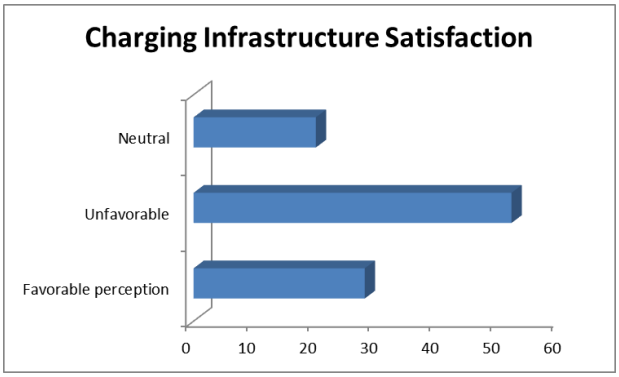

Figure 4:Charging Infrastructure Satisfaction among Consumers

2. Chi square Test Analysis

1. *Age vs Perception:* χ^2=12.8, p<0.05 (significant)
2. *Income vs Perception:* χ^2=15.6, p<0.01 (significant)
3. *Education vs Awareness:* χ^2=11.4, p<0.05 (significant)
4. .*Gender vs Perception:* χ^2=4.2, p>0.05 (not significant)

3. Summary of Hypothesis Test

Table 2:
Hypothesis test results

Variable Tested	Result
Age v/s Perception	Rejected
Income v/s Perception	Rejected
Education v/s Awareness	Rejected
Gender v/s Perception	Accepted

By evaluating all factors the null hypothesis is rejected. As there is significant association between demographic variables and consumer perception towards EVs.

XI. FINDINGS

a) Younger respondents show more positive perception towards Adoption of EV

b) High Income Groups Show a strong willingness to adopt EV

c) Education level correlates with awareness about incentives.

d) Gender differences are not statistically significant in perception

e) One of the major barrier is charging infrastructure dissatisfaction.

XII. SUGGESTIONS

The major suggestions as per the study is to provide public awareness campaign on government incentives on EVs as most of the consumers are not aware about such allowances. Also provide local subsidy information at the dealerships which will be an easier access for consumers. Government have to expand charging infrastructure facilities in semi urban areas too. By considering all these matters the adoption rate of EVs can be improved.

XIII. CONCLUSION

The study indicates significant interest in the younger people on the adoption of EVs with an equal balance in gender. The consumer perception towards EVs in Thrissur indicates a positive trend but some of the barriers are there like limited infrastructure and low awareness of incentives. Demographic Variables play a crucial role in the shaping of perception. By strengthening all the weak areas , which acts as the barrier for adoption of EV ,can enhance adoption aligning with global environment objectives and sustainable mobility goals.

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