

“A STUDY ON CONSUMER PERCEPTION ON ELECTRIC VEHICLES WITH SPECIAL REFERENCE TO WAYANAD DISTRICT”

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Abstract

Based on the current depletion of fossil fuels and its price hike, there is a need for another energy resource to run the vehicle. The automobile sector is considering Electric Vehicle as a solution to the industry and environment in India. Electric vehicles are confidently expected to decarbonize road transportation, contribute substantially to the net zero agenda, and so help to solve the climate crisis. It is increasingly assumed that electronic vehicles are the future of transportation. However, the current market penetration of Electronic Vehicles is relatively low because of government implementing policies on Electronic Vehicles. Awareness of consumer on E-Vehicle is the main problem to solve. This study focuses on the awareness about the e-vehicle among the public.

Key words: *Electronic vehicles, Consumer awareness, Government policies, Climate crisis*

INTRODUCTION

Consumer perception is a key part of supporting the growth in the early electric vehicle market. On average, consumers in many regions are largely unfamiliar with electric vehicle technology, unaware of available incentives, and uninformed about the range of benefits that electric vehicles provide. A wide range of stakeholders have taken action to increase education and awareness, including multiple levels of government, nonprofit organizations, businesses, academic institutions, local communities, and individuals. There are many opportunities to increase outreach efficacy through collaboration, especially as the technology and programs to promote it continue to mature. A well-designed, comprehensive program would utilize a range of actions to maximize consumers' exposure to electric vehicles (e.g., fleet purchases, demonstration projects, consumer awareness media campaigns, signage), and provide prospective consumers with easy access to consumer-friendly information (e.g., one-stop shop websites, test drives, easy buying/leasing processes). India is a country with the third-largest road network in the world.

Electric Vehicle market is growing rapidly in the country due to its Eco-friendly nature and Cost-effective features. Many state governments already announced EV policies and schemes. Kerala is said to be the most literate State in India. The government is taking many initiatives to promote e-mobility in India. There are almost 20+ electric vehicle dealers in India, as India leads in two-wheelers and three-wheelers market many dealers are two and three-wheelers. Kerala aims to introduce 1 million electric vehicles by 2022. The major benefit of electric cars is the contribution that they can make towards improving air quality in towns and cities. With no tailpipe, pure electric cars produce no carbon dioxide emissions when driving. This reduces air pollution considerably. Kerala has set an ambitious EV plan under which the state aims to roll out 1 million electronic vehicles on the state road. Kerala Government will build the charging infrastructure for the electric vehicles.

BENEFITS OF ELECTRIC VEHICLES

The running cost of an electric vehicle is much lower than an equivalent petrol or diesel vehicle. Electric vehicles use electricity to charge their batteries instead of using fossil fuels like petrol or diesel. Electric vehicles are more efficient, and that combined with the electricity cost means that charging an electric vehicle is cheaper than filling petrol or diesel for your travel requirements. Using renewable energy sources can make the use of electric vehicles more eco-friendly. The electricity cost can be reduced further if charging is done with the help of renewable energy sources installed at home, such as solar panels. Electric vehicles have very low maintenance costs because they don't have as many moving parts as an internal combustion vehicle. The servicing requirements for electric vehicles are lesser than the conventional petrol or diesel vehicles. Therefore, the yearly cost of running an electric vehicle is significantly low. Driving an electric vehicle can help you reduce your carbon footprint because there will be zero tailpipe emissions. You can reduce the environmental impact of charging your vehicle further by choosing renewable energy options for home electricity. Registration fees and road tax on purchasing electric vehicles are lesser than petrol or diesel vehicles. There are multiple policies and incentives offered by the government depending on which state you are in.

Electric vehicles don't have gears and are very convenient to drive. There are no complicated controls, just accelerate, brake, and steer. When you want to charge your vehicle, just plug it in to a home or public charger. Electric vehicles are also quiet, so they reduce noise pollution that traditional vehicles contribute to. In a busy fuel station during peak hours we have to wait for long time. These problems can easily be overcome with an electric vehicle. Electric vehicles have the silent functioning capability as there is no noise. The electric motor functions so silently that you need to peek into your instrument panel to check if it is on.

REVIEW OF LITERATURE

¹**Somayaji Y., Mutthu N.K., Rajan H., Ampolu S., Manickam N. (2017).** Challenges of Electric Vehicles from Lab to Road. 2017 IEEE Transportation Electrification Conference (ITEC-India

²**Shailendra Kumar, S. K. Chaudhary, Chethan K N, (2018), Commercial Viability of Electric Vehicles in India.**In this study they found that, E-vehicles are poised to cause a major disruption in the automobile as well as the energy industry across the globe. This disruption is propelled by powerful purpose of creating a greener, safer and sustainable planet.

³**Janardan prasad Kesari, Yash Sharma(2019),**in their study on “Opportunities and scope for Electric Vehicles in India, they discussed the various case studies from around the world on adopting Electric Vehicles, and conclude with how India could implement and benefit from these strategies at the local as well as national level.

⁴**Noimisha Hazarika, Pratyasha Tamuli, Amit kumar singh (2020)** Electric vehicles in the Indian Scenario, In this study they discussed about the electric vehicles have been gaining popularity in and around the world with their growing adoption in countries like China, Europe and the USA over the last few years. Several countries are aiming to make vehicles fully electric in the coming years

⁵**Lakshman Kumareshan, Saritha S. R (2022),** in a study on “Growth of green Eco-Automobiles in India”, In this study discussed about business logic for green marketing has been largely operational or technical in Business, however some executives see environmental opportunities as a major source of revenue growth in automobile industry. Levels of pollution, price hike of fuel and other factors are relatively low in developed countries, as a result of stringent regulations, the greening of most industries.

⁶**Sonali Chandra Vaibhav Jain (2022), A review on smart charging impacts of Electric vehicles on Grid,**In this study they find out that the E-vehicle market is growing all over the world. These are the solution to being independent and free from imported energy sources. To make the system sustainable, the adoption of electric vehicles is one of the options. According to the survey e- vehicle charging has various issues like high impact on the grid, voltage, current, etc.

Objectives of the Study

- This research is intended to study the consumer perception on electric vehicles with respect to wayanad district.
- To know the buying behavior of customers on Electric vehicles.

RESEARCH METHODOLOGY

This study employs a descriptive research design. The research portrays an accurate profile of respondents, consumer perception on e-vehicles. For the purpose of this study both primary and secondary data has been used. Primary data has been collected using the structured questionnaire and secondary data have been collected from the books, websites, journals etc. Sample respondents selected for the purpose of this research are 100 respondents. Respondents have been selected using the convenience sampling method. The research survey is conducted in Wayanad.

Results & Discussion

Table 1 - Demographic Profile of the Respondents

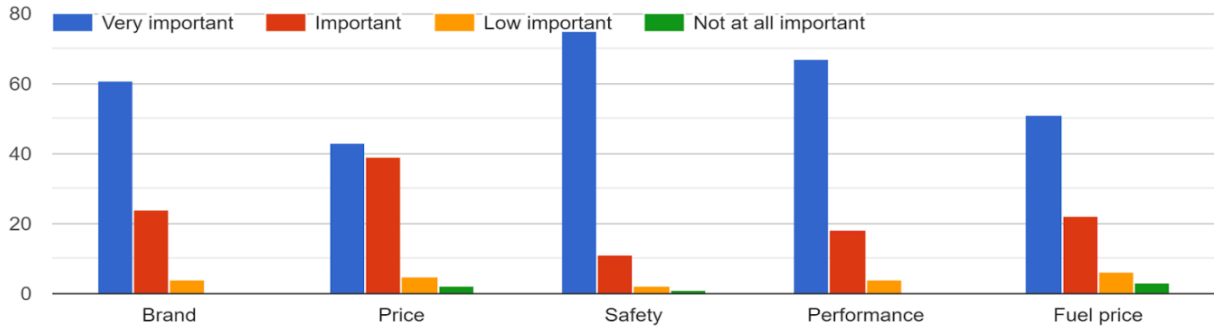
| Demographic Variable | No. of Respondents | | Percentage |
|-----------------------|--------------------|----|------------|
| Gender | Male | 72 | 80 |
| | Female | 18 | 20 |
| | Others | 00 | 00 |
| Age | 20-30years | 65 | 72.2 |
| | 30-40years | 15 | 16.6 |
| | 40above | 10 | 11.11 |
| Marital Status | Single | 34 | 37.7 |
| | Married | 46 | 51.1 |
| | Others | 10 | 11.1 |
| Occupation | Student | 23 | 25.5 |
| | Employed | 48 | 53.3 |
| | Business | 10 | 11.1 |
| | Others | 9 | 10 |

From the above table 80% of the respondents are male and 20% of the respondents are female. 72.2% of the respondents from the age group of 20-30 years 16.6 % of the respondents from the age group of 30-40 years. Only 11.11 % of the respondents are above of 40 years. 51.1 % of respondents are married persons. So we can say that most of the people who is married preferring to buy an own vehicles. Based on the occupation also we can conclude that 53.3% of the employed persons are preferred electric vehicles for their own personal use. 25.5% of the respondents are students. But they are interested to buy electric vehicles due to comfortable and fuel price.

Most preferable criteria for buying electric vehicles

| Variables | No. of Respondents | | Percentage |
|--------------------|----------------------|----|------------|
| Brand | Very important | 72 | 80 |
| | Important | 18 | 20 |
| | Law important | 00 | 00 |
| | Not at all important | | |
| Price | Very important | 65 | 72.2 |
| | Important | 15 | 16.6 |
| | Law important | 10 | 11.11 |
| | Not at all important | | |
| Safety | Very important | 34 | 37.7 |
| | Important | 46 | 51.1 |
| | Law important | 10 | 11.1 |
| | Not at all important | | |
| Performance | Very important | 23 | 25.5 |
| | Important | 48 | 53.3 |
| | Law important | 10 | 11.1 |
| | Not at all important | 9 | 10 |
| Fuel Price | Very important | 44 | 48.8 |
| | Important | 38 | 42.2 |

| | | | |
|--|----------------------|---|-----|
| | Law important | 5 | 5.5 |
| | Not at all important | 3 | 3.3 |

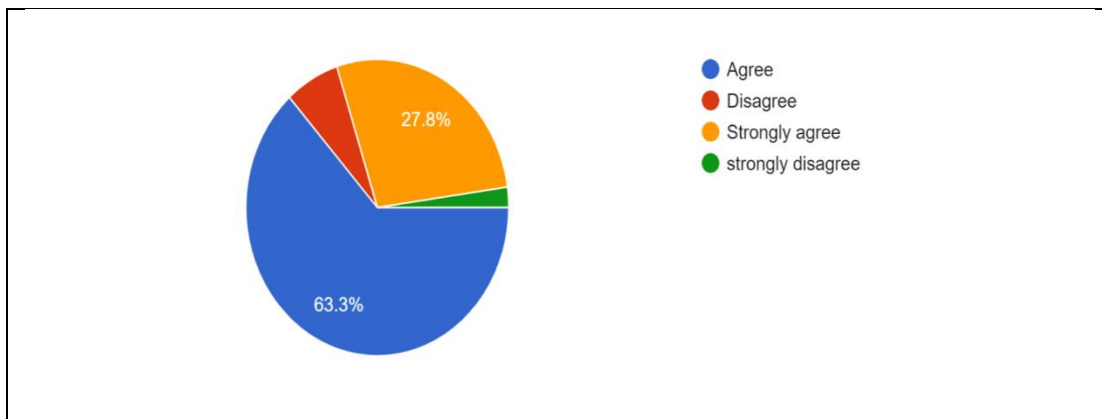


From the above chart we can find out that 70% of the respondents give very important for safety of the vehicles. 30% of the respondents prefer performance of the vehicles while choosing to buy electric vehicle.

Is the usage of electric vehicle will protect our environment from the air pollution?

| | | | |
|--|-------------------|----|-------|
| Usage of Electric Vehicle Will Protect Our Environment From The Air Pollution | Strongly Agree | 24 | 27% |
| | Agree | 60 | 63.3% |
| | Disagree | 7 | 6.3% |
| | Strongly Disagree | 9 | 3.4% |

From the above chart we can conclude that 63.3 % of the respondent choose electric vehicles because of



protect our environment from the air pollution. 27.8 % of the respondent strongly agrees to buy electric vehicles for protecting our environment from the air pollution.

CHI SQUARE ANALYSIS

Test 1: Relationship between gender and buying behavior

Ho: There is no significant association between gender of the respondents and buying behavior of the electric vehicles

H1: There is relation between gender and buying behavior of electric vehicles

Critical value: 0.05, P<0.05 Ho accept

If P>0.05 H1 will accept

OBSERVED FREQUENCY

| Respondents | Criteria to be choose by the customer | | | | Total |
|--------------|---------------------------------------|------------------------|-------------|--------|-------|
| | Fuel price | Good working condition | Performance | Safety | |
| Male | 12 | 10 | 12 | 10 | 44 |
| Female | 11 | 12 | 11 | 12 | 46 |
| Total | 23 | 22 | 23 | 22 | 90 |

EXPECTED FREQUENCY

| Respondents | Criteria to be choose by the customer | | | | Total |
|--------------|---------------------------------------|------------------------|-------------|--------|-------|
| | Fuel price | Good working condition | Performance | Safety | |
| Male | 11.24 | 10.76 | 11.24 | 10.76 | 44 |
| Female | 11.76 | 11.24 | 11.76 | 11.24 | 46 |
| Total | 23 | 22 | 23 | 22 | 90 |

$$X^2 = \sum \frac{(O-E)^2}{E}$$

E

From the above calculation we find out that the table value is 0.938928. Calculated value is 0.406. Table value is greater than that of calculated value. So the null hypothesis will be accepted and H1 will be rejected.

Test 2: Relationship between choice of vehicle and Income

H0: There is no significant difference in income group of people and their choice of vehicle.

H1: There is significant difference in income group of people and their choice of vehicle.

Actual

| Row labels | Conventional | LPG/CNG | Hybrid | Electric | Grand Total |
|----------------|--------------|-----------|-----------|-----------|-------------|
| up to 5 Lakhs | 7 | 6 | 8 | 7 | 28 |
| 5 to 10 lakhs | 7 | 6 | 6 | 5 | 24 |
| 10 to 20 lakhs | 4 | 5 | 5 | 6 | 20 |
| Above 20 lakhs | 4 | 4 | 5 | 5 | 18 |
| Total | 22 | 21 | 24 | 23 | 90 |

Expected

| Row labels | Conventional | LPG/CNG | Hybrid | Electric | Grand Total |
|----------------|--------------|---------|----------|----------|-------------|
| up to 5 Lakhs | 6.8444 | 6.5333 | 7.466677 | 7.155556 | 28 |
| 5 to 10 lakhs | 5.86667 | 5.6 | 6.4 | 6.13333 | 24 |
| 10 to 20 lakhs | 4.88889 | 4.66667 | 5.33333 | 5.1111 | 20 |

| | | | | | |
|----------------|-----------|-----------|-----------|-----------|-----------|
| Above 20 lakhs | 4.4 | 4.2 | 4.8 | 4.6 | 18 |
| Total | 22 | 21 | 24 | 23 | 90 |

Degrees of freedom in this table are 9. Table value is 16.919. Calculated value is 1.21827. Based on the rule given by chi square distribution, if the calculated test statistic is less than the appropriate critical table value, accept the null hypothesis. If the calculated test statistic is equal or greater than the appropriate critical value of the test, then reject the null hypothesis and accept the alternative hypothesis. So here the null hypothesis will be accepted. There is no significant difference in income group of people and their choice of vehicle.

SUGGESTIONS & CONCLUSION

The study shows that most of the respondents would like to buy electric vehicles for their personal use. But it includes some important reasons like awareness, facilities provided, comfortable etc. If the customers get all proper guidance from the supplier as well as from the good advertisements provided by the company they can prefer electric vehicles without any confusion. While choosing the electric vehicles for their personal use most preference will goes to their comfortable and price. From this study we found that most of the respondents have less knowledge about electric vehicles. After getting idea about the electric vehicles they would like to choose the same for their next option.

There is some significant relation between the age group of the people and buying behavior of the electric vehicles.

CONCLUSION

People who are living in India don't have depth knowledge in the usage of electric vehicles and no more idea about the comfortable features of the electric vehicles. Due to lack of knowledge about the electric vehicles more people using normal petrol or diesel vehicles. But a person who is in the age of 20 or more having lots of idea about the usage of electric vehicles is very comfortable compare to other vehicles. It will protect our environment from the air pollution. With the depletion of fossil fuels and constant hike in fuel prices, there is a need for energy transition in vehicles in India. Government has taken initiative to fight pollution levels by promoting Electronic Vehicles and giving subsidies on purchase. To boost its production, Government has eased the FDI norms. Various emerging brands are launching Electronic Vehicles in India. The Government and manufacturers should join their hands to build the infrastructure and create positive environment for Electronic Vehicles. The respondents are aware of global climate conditions and are ready to change their preference from conventional to eco-friendly vehicles. Cost is an important factor while considering the purchase of Electronic Vehicles.

REFERENCES

1. **P. Sanjeevi Kumar (2007)**,“A Comprehensive study of key electric Vehicles components, Technologies, Challenges, impacts & Future duration of Development”, DOI 10-3390/en10081217
2. **Emadi, A., Lee, Y.J. and Rajashekar, K. (2008)** ‘Power electronics and motor drives in electric hybrid electric and plug-in hybrid electric vehicles’, IEEE Trans Ind. Electron, p.55.
3. **Fanchao Liao, E. M. (2017)**. Consumer preferences for electric vehicles: a literature review. Transport review, 275.
4. **Muhammed M, G. Thamilarasan (2018)** “Study on Electric Vehicles in India Opportunities and Challenges”, International journal of Scientific Research in Environmental science and Technology,
5. **Janardan Prasad Kesari, Y. S. (2019)**. Opportunities and Scope for Electric Vehicles in India. IJME Journal, 8.
6. **Yogesh Aggarwal, V. G. (2019, September)**. Indian Electric Vehicles Storm in a teacup. HSBC Global Research, p. 13

7. **S. Shrilatha, K. Aruna (September 2021)**“Future of electric vehicles with reference to national electric mobility mission plan at Tamil Nadu”, International Conference on Energy and Environment (ICEE 2021)
8. [Escalating Demand Present and Future Status on Hybrid Electric Vehicles](https://www.researchgate.net/publication/350150060)
9. [Energy-Management-for-Electric-Vehicle-EV-integrated-Distribution-Grid](https://www.researchgate.net/project/Energy-Management-for-Electric-Vehicle-EV-integrated-Distribution-Grid)
10. [Study on energy management strategy and dynamic modeling for auxiliary power units in range-extended electric vehicles](https://www.researchgate.net/publication/308276456)