

The Challenges Encountered by Consumers During the Purchase and Utilization of Electric Two-Wheelers in Thrissur District, Kerala, India

Sreeja OK Department of Commerce Vedavyasa College of Arts and Science

ABSTRACT

Objective: This research aimed to recognize the difficulties faced by consumers in the process of acquiring and utilizing electric two-wheelers.

Methodology: Data essential for this investigation were gathered from both primary and secondary sources. Primary data collection involved structured interviews with respondents in May 2023. Secondary data were obtained from various sources such as websites, government publications, and reports. A sample of 30 respondents using electric vehicles in Thrissur was chosen through random sampling. The issues faced by consumers in purchasing and using electric vehicles were prioritized using Garrett's Ranking Technique.

Findings: According to Garrett's ranking, the primary challenges encountered by consumers in purchasing electric vehicles included high costs, while the main issues during usage were the limited availability of service centers, as well as a shortage of skilled labor for breakdowns and maintenance. Conclusion: The outcomes of this analysis will support marketers in comprehending consumer challenges, enabling them to devise and implement marketing strategies effectively, thereby enhancing their competitive advantage.

Keywords : electric two-wheelers, high cost of vehicles, inadequate service centers, shortage of skilled labor in the sector according to Garrett's ranking.

1.INTRODUCTION

The importance of being mindful of vehicle pollution arises due to the significant role of road transport in contributing to India's CO2 equivalent emissions. While various sources contribute to air pollution, the transportation sector plays a crucial role, impacting both human health and the economy. The utilization of fossil fuels in transportation and industry further exacerbates air quality, along with the surge in background noise attributed to the increasing number of vehicles on the roads. To combat vehicle pollution, the adoption of electric vehicles emerges as a favorable option, with the Indian automobile industry introducing electric vehicles to address environmental concerns. Particularly, electric two-wheelers are gaining popularity, denoting vehicles equipped with an electric motor for propulsion. The global market for electric two-wheelers was valued at US\$ 35.3 Billion in 2022, with projections indicating a growth to US\$ 72.5 Billion by 2028, showcasing a Compound Annual Growth Rate (CAGR) of 13.18% during 2023-2028. Anticipated increases in electric vehicle production and related components are poised to elevate the manufacturing sector's contribution to the GDP to over 24% by 2022-23. Notably, sales of electric two-wheelers in India surged to 8,46,976 units in 2022-23, marking a substantial increase from the previous year. The inception of electric two-wheelers in India dates back to the 1990s, pioneered by companies such as Bajaj Auto and Scooters India Ltd. In the years 2010 to 2012, the Ministry of New and Renewable Energy (MNRE) extended subsidies for electric vehicles, as per government data compiled by Clean Mobility Shift from the Vahan Dashboard, a mere 72,930 newly registered four-wheeled electric vehicles were



reported in India in 2023. Most individuals focused their attention on electric two-wheelers, with the market share of electric vehicles reaching 6.3% in 2023, leading to the sale of approximately 1379311 electric two-wheelers. The proportion of EV sales in total vehicle sales saw a steady increase from 2018 to 2023. Kerala set a precedent in India by unveiling its e-mobility policy, as highlighted in the Economic Review of 2021. The state holds the second position nationwide in the adoption of electric two-wheelers, known for their minimal contribution to air and noise pollution. Kerala witnessed a notable surge of 13.66% in the e-two-wheeler market compared to other regions, surpassing the 6.28% mark observed in 2022. In the same year, 33,438 e-two-wheelers were officially registered in Kerala. Electric vehicles play a crucial role in the global fight against climate change by curbing emissions and reducing reliance on fossil fuels. A complete shift to electric vehicles could result in a 50 to 75% decrease in pollution levels. Presently, the populace in Kerala exhibits a growing interest in purchasing and understanding electric two-wheelers. This investigation aims to assist manufacturers in identifying and addressing consumer concerns related to electric vehicle purchase and usage, allowing for suitable adjustments in pricing, product features, promotional strategies, and distribution channels to cater to consumer needs effectively.

2.LITERATURE REVIEW

1.Egbue and Long [5] conducted a study on "Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions" in Missouri. Primary data from 481 respondents were gathered. They determined if sustainability concerns affect consumers' decisions to buy electric vehicles and highlighted potential socio-technical impediments to consumer adoption of EVs. The survey offers insightful information on the tastes and viewpoints of technology enthusiast's people closely connected to technological advancement and better able to distinguish between the numerous distinctions between conventional and electric vehicles.

2. Francis and Rinil [1] analyzed the behaviour of the energy efficiency of an Electric Vehicle (EV) in Kerala (India), considering factors such as environmental conditions and traffic conditions. They discovered that each sample contains various interesting characteristics, which are then studied by correlation to determine those that influence the EV's energy efficiency. The analysis found that as battery technology improves, fossil fuel prices rise, and electric vehicle technology becomes more cost-effective, there will be an increase in government subsidies and tax breaks for EVs in the near future.

3. Kumar and Padmanaban [6] conducted a study on "Electric Vehicles for India: Overview and Challenges". Mainly secondary data were used for the study. The study found that a battery ecosystem must be created to support numerous businesses and start-ups engaged in the production of battery packs and cells. To solve range anxiety, charging infrastructure needs to be constructed properly. Swapping possibilities should also be investigated. Making all government buses electric and providing tax advantages for private EV owners are essential ways to generate demand.

4.Gabhane et.al. [7] conducted a study on "Multivariate analysis of the factors influencing consumer's purchase decision towards electric vehicles (Evs) in Maharashtra, India". The study conducted among 150 individuals through structured interviews. They identified factors like astechnological, environmental, economic, infrastructural and multivariate analysis is used to identify the importance of each factor in purchase decision. The study found that economic aspect is the most important factor in the adoption of EV, followed by environmental, technological and infrastructural factor.

5.Hiremath et.al [8] studied on a study on consumer buying behaviour towards electric vehicles in Bagalkot. Primary data is collected through structured questionnaire from 100 respondents. The study found that the majority of respondents were familiar with the vehicle models Hero and Ather, and that new trends and a favourable impact

on the environment are what motivate respondents to purchase electric vehicles. This study revealed that most of the customers are in the age category of 36-45.

6. Kumar et.al [9] made an attempt to study on consumer behaviour on electric vehicles in India. They used YouTube as a source for data collecting, and the data was then evaluated using a variety of methods, including sentiment analysis and data clouds. The study revealed that overall perception about the electrical vehicles in the country is positive and there is lot of scope for improvement and growth for electrical vehicles industry in the country. Other than Electrical vehicles offer lot of advantages over conventional petrol or diesel vehicles.

7.Ranjan et.al [2] conducted a study on consumer buying behaviour towards electric vehicle. Both primary and secondary data were used. They located 65 responders from India. According to the study's findings, the majority of people who are leaning towards purchasing an electric vehicle are concerned about the pollution created by internal combustion engines and wish to preserve the environment. It was also discovered that the price of refuelling an electric vehicle is considerably lower than that of a petrol or diesel vehicle.

8. Sreekumar et.al [10-11] conducted a study on "An analysis of the socio-economic factors affecting the acceptance of electric vehicles in Kerala with special reference to Trivandrum". There are 120 participants in the study, with a balanced representation of men and women. Utilising Google Forms, a well-structured questionnaire was distributed in order to gather the information. They discovered that growing fuel prices and the benefits to the environment were the main variables that encouraged individuals to purchase electric cars. Other technical barriers to purchasing electric vehicles were found to include a lack of infrastructure, protracted charging times, and restricted range.

3. MATERIALS AND METHODS

Data necessary for the investigation was gathered from primary and secondary outlets. The initial survey was carried out among the participants via a pre-arranged interview schedule in the month of May 2023. Information from websites, governmental publications, and reports were considered as secondary data sources. A total of 30 individuals utilizing electric vehicles were chosen from Thrissur through a random sampling approach. Garrett's ranking technique was employed for the analysis to prioritize the issues highlighted by the respondents.

4. RESULTS AND DISCUSSION

Kerala, renowned for its ecological sensitivity, rich biodiversity, and appeal to tourists, aspires to uphold its essence while ensuring a sustainable development trajectory for its populace. The shift towards electric vehicles emerges as a logical decision for the region in alignment with its overarching developmental principles. In accordance with the FAME INDIA Scheme by the Government of India and the sanction of the Electric Vehicle policy by the Government of Kerala, ANERT is devising plans for the deployment of E Vehicles and establishment of charging infrastructure throughout Kerala. In furtherance of this objective, ANERT has initiated a novel program to supply electric vehicles to Government Departments through leasing arrangements. The adoption of electric vehicles (EV) is witnessing a notable surge in Kerala, with statistics indicating that 39,540 EVs were registered in the state in 2022, a substantial increase from 8,701 registrations in 2021 and 1,325 in 2020. Kerala has set a target of introducing 1 million EVs in the state by 2022, encompassing a fleet composition of 200,000 two-wheelers, 50,000 three-wheelers, 1,000 goods carriers, 3,000 buses, and 100 ferry boats. Aligned with the Electric Vehicles policy of the Kerala government, which envisions transitioning 10 lakh vehicles to electric by 2022, driven by the eco-friendly, cost-effective, and fossil fuel-reducing attributes of electric mobility. State Government entities are being incentivized to shift from petrol or diesel vehicles to electric mobility for their official leasing/hiring needs. The Ministry of Skill Development and Entrepreneurship (MSDE) anticipates that the EV sector could generate 10



million direct employment opportunities by 2030, consequently fostering an additional 50 million indirect jobs. Notably, electric two-wheelers play a pivotal role within the EV landscape. The global market size for electric two-wheelers reached US\$ 35.3 Billion in 2022. Despite the numerous advantages associated with electric vehicles, consumers, particularly of electric two-wheelers, encounter challenges during the purchase and utilization phases. A study was conducted to analyze the issues faced by consumers in procuring and operating electric vehicles. The primary concern identified during the purchase phase was the high cost of electric vehicles, notably electric two-wheelers, which are comparatively pricier than conventional vehicles. Meanwhile, challenges faced during usage centered around the lack of service centers, followed by a shortage of skilled technicians for breakdowns and maintenance, attributed to limited awareness and service offerings within the electric vehicle sector.

5. CONCLUSION:

The increasing popularity of electric two-wheelers is on the rise. NITI Aayog's objective is to attain a 70% penetration of EV sales in all commercial cars, 30% in private cars, 40% in buses, and 80% in two and threewheelers by the year 2030. This target aligns with the aspiration to achieve net zero carbon emissions by 2070. Electric two-wheelers (E2W) already account for over 3% of total two-wheeler sales, while electric threewheelers (E3W) represent more than 50% of total three-wheeler sales. Projections indicate that this trend will continue, with an estimated Compound Annual Growth Rate (CAGR) of 49.79%, resulting in annual sales of 191.5 lakh EVs by FY 2030 (according to JMK Estimates). E-bikes alone are projected to contribute over 80% to the total EV sales by FY 2030. The outcomes of this research will support marketers in comprehending the challenges encountered by consumers in the acquisition and utilization of electric vehicles. This insight would empower marketers to effectively formulate and implement their marketing strategies, enhancing their competitive advantage. It is imperative for the government to prioritize the promotion of electric vehicle usage in Kerala due to their ecofriendly nature. Dissemination of information regarding the various incentives and advantages linked to electric vehicles through diverse media channels should be emphasized. Companies should enhance their post-sales services by employing skilled personnel. Collaborative efforts between the government and private sector are essential to allocate manpower, resources, and finances towards advancing the production and research & development of electric vehicles.

COMPETING INTERESTS: Author have declared that no competing interests exist.

REFERENCES

1. Francis RP, Rinil MR. Feasibility of electric vehicles in Kerala. Int. J. Advanced Res. in Comput. Commun. Eng.2019; 8(1):149-154.

2. Ranjan I, Sawan KJ, Shuvam MA Study on consumer buying behaviour towards electric vehicle. Int. J. Innovative Sci. Res. Technol. 2022;7(6):325-346.

3. Sebastian G. Preference and adoption towards electronic vehicles among youngsters. Int. J. Advance Res. Ideas Innovations in Technol. 2021;7(5):606-609.

4. SMEV [Society of manufactures of electric vehicles]. 2020. [on line]. Available: https://www.smev.in Accessed On:15 May 2023.

5. Egbue O, Long S. Barriers to widespread adoption of electric vehicles: An analysis of consumer attitudes and perceptions. Energy policy. 2012;48:717-729.

6. Kumar R, Padmanaban S. Electric vehicles for India: overview and challenges. IEEE India Informatics. 2019; 14(139):2019.

7. Gabhane D,Chavan VD, Goswami BR. Multivariate analysis of the factors influencing consumer's purchase decision towards electric vehicles (EVs) in Maharashtra, India. J. Positive Sch. Psychol. 2022;4837-4845.



 8. Hiremath C, Tapashetti RB, Hunnur RR. A study on consumer buying behaviour towards electric vehicles in Bagalkot. J. Emerging Technologies Innovative Res. 2022;9(9):254-278.
9. Kumar P, Alam S, Rana A. Consumer behaviour on electric vehicles. Int. Res. J. Modernization Eng. Technol. Sci. 2022;4(3):897-906.

10. Sreekumar V, Devadevan S, Baburaj A. An analysis of the socio-economic factors affecting the acceptance of electric vehicles in Kerala with special reference to Trivandrum. Amity J. Professional Practices. 2022;2(1). 11. NITI Aayog [National Institution for Transforming India]. Forecasting penetration of electric two-wheelers in india[on-line]; 2022. Available:https://www.niti.gov.in/sites/defa ult/files/2022-06/ForecastingPenetrationofElectric2W 28-06.pdf Accessed On: 20 May 2023. 12. GOK [Government of Kerala]. Economic Review 2021[on-line]; 2021. Available:https://spb.kerala.gov.in/sites/def ault/files/2022-03/ECNO %20ENG 21 %20Vol 1.pdf Accessed on:25 May 2023. 13. Arjun S. Electric vehicle sales soar in Kerala in 2022. Mathrubhumi: 2023

In the appendix of the research conducted, the respondents' assessment of various issues was transformed into numerical values through a specific formula. This formula is defined as follows: Percent position = 100 (Rij-0.5)/Nj, where Rij represents the rank assigned to the Ith variable by the jth respondent, and Nj is the total number of variables ranked by the jth respondent. Utilizing Garrett's Table, the estimated percentage positions were converted to scores by referencing the table introduced by Garret and Woodworth (1969). Subsequently, the accumulated scores for each individual pertaining to different factors were computed, followed by the calculation of total value scores and the mean values of the scores. The factor with the highest mean value is identified as the most significant factor in the analysis.