

A STUDY ON REVIEW OF LITERATURE: CONSUMER BUYING BEHAVIOUR TOWARDS E-MOPED

Dr. Aatish Zagade

Deputy Director, Indira Global Business School, Pune
9823939483; aatish.zagade@indiragbs.edu.in

Durgesh Kadam

MBA Final Year, Indira Global Business School, Pune
97 30 02 99 89; durgesh.kadam@indiragbs.edu.in

Saumya Jadoun

MBA Final Year, Indira Global Business School, Pune
79 72 88 64 42; saumya.jadoun@indiragbs.edu.in

ABSTRACT:

Education has been a boon for mankind and yet again we are relying on our educational prowess to fight the evil of environmental change. Though a modest approach but should be a breakthrough if we consistently work towards sustainability. India a developing but critical contributor to global sustainability has set an ambitious program toward a greener future.

The electric vehicles (EV) market is growing tremendously all over the world but was lagging behind the much-required impetus in the Indian market. Recent government interventions and policy changes have seen substantial momentum in the EV market in India.

This paper makes a modest attempt to understand the consumer perspective toward electric vehicles. Economic, social, technical, and environmental factors affecting the electric vehicles market in India are discussed in this paper. The battery and infrastructure development is related to economic and technological factors as discussed. Different attributes are considered by the consumers in their buying behavior. Recommendations are then made according to the challenges and to promote the market growth of electric vehicles. The factors that influence customers in buying an electric vehicle are not only about the design and development of electric vehicles that suit customer demands but it also serves as a conceptual idea in which Electric vehicles can be profitable and provide a choice for Consumer's purchase.

INTRODUCTION:

During the last few decades, the environmental impact of the petroleum-based transportation infrastructure, along with the fear of the rising price of oil has led to renewed interest in electric transportation infrastructure. The automobile industry has been one of the fastest-growing industries in India as well as in the world, and in recent times the automobile industry has been going through significant changes in its technology as they focus on moving toward Green Vehicles. The 'National Electric Mobility Mission Plan (NEMMP), 2020' which was introduced in India in 2013 has the plan to make a major shift to electric

vehicles and focuses on the issues of national energy security, vehicle pollution, and the growth in domestic manufacturing sectors.

Pollution associated with the automobile industry in India is one of the responsible factors for such a drastic change in the automobile industry. As most of the cities in India have high pollution and noise level rates in the world, according to the WHO report 2019 for most polluted cities, 14 out of the top 20 cities in the world are from India. Electric Vehicles can bring a major change to India in becoming self-sustainable. This can only be done if the right facility and infrastructure are provided by the government.

This paper will try to examine what is Consumer Behavior Towards E Moped, what consumers are thinking about the E Moped, and whether are they accepting E Moped? If yes then in which price segmentation consumers are ready to buy it? What challenges Companies are facing to penetrate the Indian Market?

RATIONALE OF STUDY:

UN in its sustainable goals has highlighted the importance of a sustainable environment for a better future and it has been a consistent endeavor to convince and involve maximum stakeholder countries towards an effective plan of action. India is one of the largest countries in terms of economic growth and has the potential to be in the top slot and thus calling for immediate action towards a sustainable future to maintain a good balance between economic growth and safeguarding the environment.

The main Research Gap is, In India, the E Moped market is booming in some regions, People are buying the E Moped in some regions, what matters here is the companies are facing problems penetrating in Indian Market properly. What challenges are they facing? To sell E Moped. In which attitude people are seen to Companies for buying E Moped?

OBJECTIVE:

- To identify the buying motives of consumers towards E Moped in India.
- To analyze the challenges faced by consumers while buying E Moped.

LITERATURE REVIEW:

Electric vehicles reduce environmental pollution, global warming declines, and fossil fuel dependency is lowered. The impact of electric vehicles is still low in the automobile market. The economical and psychological approach toward EVs will change its position in the market as consumers will change their buying decisions. The Financial and technological attributes of E-moped are very crucial. The attributes include vehicle performance brand positioning and diversity in the market and including its purchase and operating cost, driving range, and charging duration are important. Different incentive policies and tax reduction by the government is highly effective. (Fanchao Liao, 2017)

A strategy should be adopted for the growth of EVs demand in India as the implementation of EVs is a challenge for the government. Different demographics like diverse public and geography can cause

problems and these problems will require feasible solutions. Public acceptance is expected as a crucial aspect of the growth of EVs. Investments in public transport will help to increase the sales and usage of EVs among consumers. The initial growth is a delicate stage for the procurement of electric vehicles among consumers. It can be said that private EVs may take 5-6 years to procure popularity and acceptance in the market. (Janardan Prasad Kesari, 2019)

The initial growth stage for electric vehicles is carrying on but different barriers prevent their widespread growth and development. The various barriers consist of the extra or additional costs of new technology, the inconvenience of technology including range and charging times, and the understanding of consumers regarding the viability and availability of the technological advancements. Hence, consumer awareness is a very important and crucial aspect. (Lingzhi Jin, 2017)

The transportation of goods has a prominent impact on urban movement. The probable incorporation of electric vehicles in urban areas and their logistical operations are done by researchers. A speedy group with different technologies is a solution that gives an opportunity in reducing the costs incurred in the last mile. Mix vehicle routing problems and the fleet size with time windows for the electric vehicles are presented by the researchers. The variation in the range of EVs was taken into consideration by the authors. EVs are the most competitive technology in the section of small vans and are cost competitive for longer distances in the segment of large vans. For this diesel is an interesting solution from a financial perspective. For the segment of trucks or heavy transport, hybrid vehicles are chosen to cut down the running costs and the fixed costs. (Philippe Lebeau, 2015)

Instead of going for vast change to manage the loading issues, India should be investing in small-scale reinforcements. Charging at the consumer's personal space, at their homes should be uplifted. Before installing huge charging infrastructure different factors should be considered and proper planning and implementation should be done. Factors like population, place, traffic density, and safety. Merging activities in the energy and transport field is very crucial. For the development and smooth functioning of electric vehicles, various innovative policies and programs should be implemented. The drivers of electrical cars are offered various incentives such as tax credits, subsidies, free parking, discounted tolls, and allowances that will motivate the growth of EV market. (Dash P. K., 2013)

Transportation on a shared basis is an effective way that will help users to gain short-term access to vehicles as needed. This has brought tremendous changes in the consumer's perspective and how individuals plan their transport trips. Moped sharing systems is widely adopted by various cities around the world and the mobility service provided has prominent features so that it can be used in urban areas for traveling. Moped sharing increases flexibility and accessibility with a fixed route and fixed schedule of public transit services. (Shaheen and Chan, 2016)

The gap between a negative consumer experience and the expectations of purchase will likely decide an unsatisfactory product. To prevent any negative outcomes companies will make prominent investments to

improve consumer's post-purchase experience by providing improved customer service and giving product guarantees. Different studies found responses to consumer complaints related to repeated purchase intentions. (Cho, Im, Hiltz, & Fjermestad, 2002; Estelami, 2000; Technical Assistance Research Programs, 1979).

The research concludes longer-term uplift of electric vehicles will tremendously depend on the progress of technological advancements in the battery to cut down the costs and increase energy density and provision of suitable recharging stations and infrastructure. (Marcello Contestabile, 2012)

RESEARCH METHODOLOGY:

India offers the world's largest untapped EV market, especially in the two-wheeler segment. With several automakers rolling out EV vehicles at a rapid pace, the penetration of these vehicles has increased significantly in the past few years. As per a recent study, the electric vehicles (EVs) market is expected to be worth around at least ₹ 475 billion by 2025. The penetration of electric two-wheelers is projected to reach up to 15% by 2025 from 1% currently.

Capital cost has always been a major factor in the EV purchase decision, with 63% of consumers believing that an E Moped is beyond their budget. The lack of adequate charging infrastructure in our country is a huge barrier to increased E Moped penetration. Compared to traditional petrol stations, charging stations are harder to find, normally limited by investment costs and difficult infrastructure development enabling people to charge where they usually park, at home or at work, which presents its challenges, such as dealing with multi-tenant buildings, grid-connection management, and charging slot availability. It is anticipated that there will be a shortage of nickel, and scaling up lithium production would be a challenge, leading to a supply shortage that may cause manufacturers to use lower-quality mineral inputs, adversely affecting battery performance.

Electric engine reduces pollution and profit to the consumers is provided. It will help in environmental improvement. There are different opportunities and challenges. Opportunities are included in charging, batteries, government initiatives, industry, and environmental welfare. It cuts down the fuel or oil usage and the expense incurred in it. EVs help in reducing Greenhouse gas emissions. Many countries have already implemented this technology and they are contributing to the improvement of the environment. So Government should tackle challenges and take opportunities in the automobile market. (Mohamed M, 2018)

In carbon emission, the transport sector is around 18% responsible for this cause. This scenario can be beaten with EVs as another alternative for vehicles burning fuel. Nowadays companies are launching and introducing electric vehicles in the market. Governments and companies should promote EV to reduce fuel dependence and pollution which will be beneficial to both, consumers as well as the nation. Government should spread awareness regarding the benefits of EVs so that a positive perspective should be developed in the view of consumers. (Masurali.A, 2018)

The increase in pollution globally has given rise to carbon emissions and efforts made to eradicate such problems will help to fight the harmful effects caused to the environment. Carbon emissions should be reduced caused due to the use of fuel vehicles. Government should plan to introduce Electric vehicles in the Indian market and spread awareness among the consumers regarding its benefits. The National Electric Mobility Mission Plan 2020 has included an in-depth report on EVs. The overall market for EVs and their implementation should be properly planned with the help of the Research and Development department.

Proper charging utilities should be provided to the consumers. Taxes should be exempted and various incentives should be given to the consumers to increase demand in the market. (Mr. A. Rakesh Kumar, 2019)

The selection of EVs depends on different factors. It depends upon factors like environmental concern, safety, comfort, trust, social acceptance, technology, and infrastructure availability. These factors are tested on both conventional cars and electric vehicles as well. The manufacturers of electric mopeds and the Government have to invest in social acceptance of vehicles in the market. Advancements in technology can be done to create trust in the consumers. EVs reduce pollution and provide benefits and safety to the environment. To promote the use of EVs government and manufacturers should take the responsibility for the betterment of consumers and the nation. (Pretty Bhalla, 2018)

Consumer behavior can be altered and improved concerning EVs with different consumer awareness campaigns empowered with various promotions and increase the reach and visibility of electric vehicles and engagement of potential consumers. In a survey, 21% of the buyers of EVs learned about electric vehicles from social media (The Climate Group, 2013). The results of a survey in Norway illustrated the benefits and importance of the social network in the buying behavior of consumers. (Figenbaum, 2016).

Consumers traveling for short distances will probably consider an electric moped but the ones who travel longer distances and have conventional vehicles will not easily move to electric vehicles. For four-wheelers, it is sort of simple to get the improved version with increased battery size. But for electric two-wheelers, each increase in kWh may provide an extra 30km in range, but the increase in weight is about 10kg, around 10% increase in the total weight of the vehicle. This weight issue is even more prominent in smaller bikes that are less than 150cc. (Yogesh Aggarwal, 2019)

The market share for electric vehicles is low. It is around 0.1% only. The vehicles that are running on fossil fuels are leading in the market causing global warming, pollution, and harm to the environment. Consumer perspective can be observed as the gap between fuel production and consumption is widening. India imports around 70% of oil per annum. We need to find an alternative that is more sustainable and cleaner. There's an urgent need to investigate factors and challenges in finding alternatives. (Pritam K. Gujarathi, 2018)

Consumers in big cities have estimated travel of 100km whereas in Tier II and Tier III cities travel radius is 20-40km. Hence there is a necessity for swapping stations in at least big cities where the consumer can drive without worrying about recharging batteries. There is a range of potential market barriers that limit the ability of EV industry to rising demand an underdeveloped charging ecosystem continues to impede a higher penetration in the two-wheeler consumer segment. The absence of a robust manufacturing ecosystem for the materials associated with the E Moped revolution, coupled with the concentration of the supply chain in certain regions, is likely to draw these issues into still sharper focus in the coming years.

From the above reviews and research, we can say that E vehicle procurement depends on many variables like purchase cost, operating cost, maintenance, performance, and regulation. Consumers value various attributes differently and environmental concern plays a major role in the growth of the electric vehicle market.

FINDING AND RESEARCH IMPLICATIONS:

Use of E Moped Reduces pollution and Global warming effects which leads to a cleaner environment with no congestion charges compared to fuel vehicles. Usage of E Moped Cuts down the fuel and oil usage leading to optimum utilization of resources. E Mopeds can have significant emissions benefits over conventional vehicles. All-electric vehicles produce zero tailpipe emissions when operating in all-electric mode. E Moped or E vehicle gives Lower running costs with low or no vehicle tax along with the benefit of Government incentives. More use of renewable sources of energy (Hydroelectricity, Wind Energy, Etc.) for the batteries leading to sustainable use is an important goal. E Moped gives a Better driving experience to the consumer with all the facilities.

RESEARCH IMPLICATIONS BENEFITS:

Fuel Economy

Electric vehicles can reduce fuel costs dramatically because of the high efficiency of electric-drive components. Because all-electric vehicles and PHEVs rely in whole or part on electric power, their fuel economy is measured differently than that of conventional vehicles.

The fuel economy of medium- and heavy-duty all-electric vehicles and PHEVs is highly dependent on the load carried and the duty cycle, but in the right applications, all-electric vehicles maintain a strong fuel-to-cost advantage over their conventional counterparts.

Emissions

E Moped can have significant emissions benefits over conventional vehicles. All-electric vehicles produce zero tailpipe emissions, and PHEVs produce no tailpipe emissions when operating in all-electric mode. HEV emissions benefits vary by vehicle model and type of hybrid power system.

Batteries

The advanced batteries in electric vehicles are designed for extended life but will wear out eventually. Several manufacturers of electric vehicles are offering 8-year/100,000-mile battery warranties. [Predictive modeling\(PDF\)](#) by the National Renewable Energy Laboratory indicates that today's batteries may last 12 to 15 years in moderate climates (8 to 12 years in extreme climates).

Check with your dealer for model-specific information about battery life and warranties. Although manufacturers have not published pricing for replacement batteries, some are offering extended warranty programs with monthly fees. If the batteries need to be replaced outside the warranty, it may be a significant expense. Battery prices are expected to decline as battery technologies improve and production volumes increase.

Operation cost analysis

The calculation takes into account the recent rise in petrol prices, which is fast reaching the Rs 100 per liter mark, while diesel is being sold at over Rs 80 per liter. Consequently, the running cost of EVs comes to Rs 1 per km, Rs 9 for petrol, Rs 6 for diesel, and about Rs 2.5 per km for vehicles being run on CNG.

Notably, a home-based 7-kilowatt hour charger takes about 6-8 hours to fully charge a vehicle with a battery size of over 40 kWh. This period comes down as the battery size decreases.

Example: A 40 Kwh battery installed in leading EVs (like in Hyundai Kona Electric) can provide ranges from 350-400 km on a full charge. The running cost of this size of the vehicle in a home charge infrastructure will be less than Rs 1 per km. Now, a fast DC-type charger will do the job in less than an hour but the range here is anywhere from Rs 1,000 to Rs 2,500 per full charge. This would substantially increase the running cost of EVs to close to Rs 6 per km, more than what you will get in a CNG-run vehicle and close to the most efficient diesel vehicles.

CONCLUSION:

Based on this research we conclude that we found benefits and challenges for E Moped in India.

Transport is a fundamental requirement of modern life, but the traditional combustion engine is quickly becoming outdated. Petrol or diesel vehicles are highly polluting and are being quickly replaced by fully electric vehicles. Fully electric vehicles (EV) or E Moped have zero tailpipe emissions and are much better for the environment. The electric vehicle revolution is here.

The running cost of an E Moped is much lower than an equivalent petrol or diesel vehicle. E Moped use electricity to charge their batteries instead of using fossil fuels like petrol or diesel.

Registration fees and road tax on purchasing E Moped are lesser than petrol or diesel vehicles. There are multiple policies and incentives offered by the government along with tax benefits.

E Moped don't have gears and are very convenient to drive. There are no complicated controls, just accelerate, brake, and steer. There is a better driving experience for the consumer.

More use of renewable sources of energy (Hydroelectricity, Wind Energy, Etc.) for the batteries leading to sustainable use is an important goal.

Thus, the above research provides a precursor to the future course of action, where further research can focus on an empirical approach to study the impact E Moped.

The basic conclusion is that E Moped is preferable to Petrol or Diesel Vehicles but there are some major challenges faced by E Moped companies in the Indian market but these challenges can be overcome.

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