



CUSTOMER SATISFACTION TOWARDS ELECTRIC BIKES A STUDY IN HASSAN CITY

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Abstract: This paper investigates the evolving landscape of customer satisfaction towards electric bikes among the global shift towards sustainable transportation. Through a comprehensive review of existing literature, the main objectives of this study are: To study the evolution of electric vehicles in India, to study the government framework for promoting electric vehicles in India, and to examine the role of government policies, marketing strategies, and technological advancements in shaping customer perceptions and purchase intentions towards electric bikes. Additionally, the study aims to explore the advantages of electric vehicles over ordinary fuel-based vehicles and to analyse and examine the satisfaction level of electric vehicle users in Hassan city, Karnataka. The geographical area of Hassan City was selected using the convenience sampling technique. The data collected from the respondents include aspects such as price, ease of riding, speed, mileage, maintenance cost, and running cost of electric bikes. This paper aims to provide valuable insights for automakers, policymakers, and stakeholders to enhance the adoption and acceptance of electric bikes in the market.

Key Words: customer satisfaction, Government policies, Technological advancement, Hassan City

1. INTRODUCTION

Consumer satisfaction is vital to the outcome of your business. Regardless of how creative your item or cutthroat your valuing, in the event that your clients are at last troubled, they won't keep close by.

Customer satisfaction is the gauge of contentment derived from the alignment of a product or service provider with customer needs and expectations, encompassing interactions pre and post-sale, as well as during the transaction. In Philip Kotler's perspective, it is the emotional response reflecting pleasure or disappointment arising from the evaluation of a product's perceived performance against one's expectations.

Consumer loyalty is a proportion of how individuals feel while collaborating with your image. It very well may be affected by quite a few elements, for example,

- perceived product quality
- perceived product value
- convenience
- customer expectations
- communication
- complaint handling

Why customer satisfaction is important

Measuring and improving customer satisfaction is crucial for several reasons:

- ❖ **Boosting customer lifetime value:** Investing in retaining existing customers is more cost-effective than constantly acquiring new ones. Satisfied customers are more likely to make repeat purchases, increasing their lifetime value and profitability for your business.
- ❖ **Minimizing customer churn:** Satisfied customers are less likely to stop buying from you, reducing the need to focus on acquiring new customers.
- ❖ **Enhancing brand reputation:** Satisfied customers are more likely to recommend your business to others, leading to positive word-of-mouth and online reviews.
- ❖ **Driving revenue growth:** Customer satisfaction strategies can passively contribute to revenue growth by encouraging repeat purchases and referrals, allowing for a steady and potentially increasing revenue stream.

Regular evaluation of customer satisfaction ensures continuous improvement and on-going success.

2. REVIEW OF LITERATURE

1. Asian Development Bank (2009)

“Electric Two-Wheelers in India and Viet Nam Market Analysis and Environmental Impacts” this report is conducted by Asian development bank for analyse the electric two-wheeler market and its impact on environment in Vietnam and India. It has been resulted E-bikes can possibly further develop air quality also; diminish ozone depleting substance outflows in Viet Nam and India. This exploration created a few models to gauge the impacts of strategy measures and innovative enhancements for vehicle decision and, eventually, air quality. The utilization of these models can test a number of strategy and innovation situations, of which a few are introduced in this report. Future work can apply these models to explicit strategies or enhancements in execution or cost. Quite, the models don't assess the elements in general that could impact decision, as proven by the "elective explicit constants" for fuel bikes. These constants incorporate quite a large number factors that shift between vehicle types yet are unnoticed, and probable incorporate issues related to discernment. E-bike reception can increment with a mix of expanded execution, marked down cost, guidelines inclining toward e-bikes (or then again hurting fuel bikes), moved along foundation, and powerful promoting. These are challenging to accomplish, however the advantages could displace different techniques toward diminishing environmental issues.

2. Mr. Omkartupe, Prof- Shweta Kishore (2014)

“Consumer perception of electric vehicles in India” this study has been conducted with the aim of get to know about how people are preferential in buying electric vehicles. Through this paper potential scope of Electric vehicle in India has been studied and Consumer perception for same has been drawn out and they concluded

that with the consumption of petroleum derivatives and steady climb in fuel costs, there is a requirement for energy progress in vehicles in India. Govt has stepped up to the plate and battle contamination levels by advancing EVs and giving endowments on buy. To help its creation, Govt. has facilitated the FDI standards. Different arising brands are sending off EVs in India. The Government and makers ought to join their hands to construct the foundation and establish positive climate for EVs. The respondents know about worldwide environment conditions and are prepared to change their inclination from regular to eco-accommodating vehicles. Cost is a significant element while thinking about the acquisition of EV.

3. S Selvi (2017)

“A study on customer satisfaction towards electric bikes with special reference to Coimbatore city” This Paper spread the knowledge about satisfaction level of clients towards electric bike with special reference to Coimbatore city and the example gathered for the review was 200 respondents. And they have concluded that the concept of e-bike has come into Coimbatore in the past 4-5 years and the equivalent is picking up speed, as there are around 10 sellers as of now for e-bicycle in the city. As an eco-accommodating item it is more appropriate for city as it can decrease the discharge of destructive gases and accordingly it can decrease the climatic contamination. Because of regular increment in the fuel costs, the electrically charged vehicles appear to be the least expensive one contrasted with the customary vehicles. E bikes are more reasonable for rustic regions where the quantities of petroleum bunks are not satisfactory, so the rustic individuals can accuse the vehicle of the assistance of power.

4. Vishnu B M (2018)

“Analysis of electric vehicle Market in India” this research paper was intended to study the market activeness in India and to determine the future Indian electric vehicle market, what are the measures should be taken by Indian government and also by companies to develop the e vehicle usage and manufacturing with all these objectives report suggest that Taking into account improvement, noteworthy government strategies execution, Indian individuals purchasing concerns, reaction to new advances and financial aspects, the development of internal combustion motor innovation will stay sought after with programmed transmission vehicle request will ascend in future.

Crossover fuel innovation development will be restricted because of cost. Transformation of the regular vehicle into the module cross breed electric vehicle by retrofitting may have a colossal market in India. EV what's more, PHEV will have promising future in India, notwithstanding, its on-going development will be restricted and the cut-off is chosen by strategies and mindfulness creation. A way towards manageable transportation will go in sluggish space for an additional time because of absence of EPT maker, clear strategy and its execution.

3. OBJECTIVES OF THE STUDY

1. To Study the evolution of electric vehicles in India.
2. To Study government framework for promoting electric vehicles in India.
3. To study advantages of electric vehicles over ordinary fuel-based vehicles.
4. To study the satisfaction level of electric vehicle users in Hassan city, Karnataka.

4. HYPOTHESIS FOR THE STUDY

Hypothesis 1: Users of electric bike are happy with the performance of the bike and offers, facilities given by company and government level.

Hypothesis 2: Users of electric bike are not happy with the performance of the bike and offers, facilities given by company and government level.

Hypothesis 3: Users of electric bike are partially happy with the performance of the bike and offers, facilities given by company and government level. And it needs further improvements.

5. METHODOLOGY OF THE STUDY

Geographical area covered:

For our study we have chosen place of the study and survey in Hassan_city only with the concern of time availability and convenient purpose.

Sample design:

- Type of sampling used: convenient sampling technique
- Location : Hassan city only
- Sample size : 104 Electric bike users

Data collection method:

- **Primary data-**

For this study purpose, I have been collected information through E mail questionnaires from fifty (104) sample electric bike users for getting their expectations and satisfactory level.

- **Secondary data-**

The secondary data also been used, such as data are collected from business magazines, company websites, retailer websites, government websites, articles, research papers and some other internet sources have utilised for the study.

6. THEORYTICAL FRAMEWORK

6.1 EVOLUTION OF ELECTRIC VEHICLES IN INDIA

Today, EVs are the interesting topic representing things to come of versatility. What's more, however the flood has been going on since the last 10 years, electric vehicles have been hanging around for a more extended time frame.

Electric vehicles date back to the 1800s. Anyos Istvan Jedlik planned a model of the electric vehicle in 1828; it was an American Inventor, Scotsman Robert Anderson, who fostered the principal working electric vehicle during the 1830s.

William Morrison made the primary electric vehicle in the United States in 1891. His six-traveller cart finished out at 14 miles each hour. Furthermore, it was Morrison's creation that supported interest in electric vehicles.

Not at all like their steam or fuel contenders, were the vehicles known for their smooth, calm rides and simple to-control arrangement. Since early gas vehicles expected many change to change gears, which was hazardous and depleting, individuals began selecting electric vehicles, prompting their prominence and request.

In India In 1996, the first electric vehicle that is Three Wheeler VIKRAM SAFA was created by Scooters India Pvt Ltd, Lucknow and roughly 400 vehicles were made and sold. These vehicles ran on 72 volt lead corrosive battery.

Sharmaev-Clinton

“Vikram EV: the first zero emission electric (battery-driven) 3-wheeler of the world”

Former US President Clinton during his visit to Taj Mahal in India was shown this contamination free vehicle as Mr. Berry of USAID advised him about different zero emission items being created in India.



Picture of Vikram EV

In 1999, Mahindra and Mahindra Ltd. Sent off its most memorable electric three-wheeler and furthermore sent off another organization, situated in Coimbatore, in 2001, to make and sell electric vehicles named Bijlee. In 2004, MEML was shut down because of absence of interest.



Picture of Mahindra Bijlee

Mahindra again began at Haridwar plant in 2006 and keeps on delivering electric vehicles according to showcase interest.

In 2000, BHEL fostered an eighteen-seater electric transport. Its power pack comprised of an AC Induction Motor and 96V Lead corrosive battery pack. Exactly 200 electric vans were constructed and run in Delhi, with financial help from MNES. The central issue with these vehicles was their unfortunate consistency, loser and extremely significant expense of battery.



Picture of eighteen-seater electric van (2000)

In 2001, REVA, Bangalore, entered the EV industry in the vehicle business with a vehicle created by American organization (Amerigon). Nearly 3200 vehicles had been sold overall including roughly 1500 vehicles that had been sold in India, for the most part in Bangalore city.



In 2007, in bike portion, Hero cycles teamed up with UK based ULTRA Motor to send off a progression of bicycles. Different organizations, for example, Electrotherm India, TVS Motor, and Hero electric and so on are additionally assembling and selling their items. Goodbye Motors, Maruti Suzuki, Toyota and numerous different organizations began entering Indian market with battery and half and half electric vehicle items.



6.2 REASONS FOR INTRODUCING ELECTRIC VEHICLES IN INDIA

Electric vehicles (EVs) utilize electric motors powered by batteries charged through a power supply, contrasting with conventional petroleum and diesel vehicles. According to a NITI Aayog report, transitioning to electric, shared, and connected mobility in India could result in significant energy and emission savings by 2030, including a reduction in diesel and petrol consumption. Leading manufacturers such as Maruti Suzuki, Hero Electric, and Mahindra are already active in the Indian EV market, with collaborations like Suzuki and Toyota planning EV launches. India's high levels of vehicular pollution, with 13 of the world's 20 most polluted cities, underscore the urgency for EV adoption. Government incentives and lower taxes on EVs further promote their affordability and environmental benefits, as they emit no harmful gases and contribute to energy security by utilizing renewable sources. Additionally, EVs require less maintenance and operate quieter than traditional vehicles, reducing noise pollution.

Some other major reasons for introduction of e vehicles in India are

- Petrol or diesel are non-renewable resources and they are diminishing step by step and one day it will be done totally so the need of the time is that we ought to move towards others option in contrast to it like electric Vehicles.
- The expense of petroleum or diesel cost additionally expanding step by step particularly in India it is exceptionally high and on the off chance that we discuss electric vehicles, they cost extremely low in contrast with diesel or petroleum.
- Also, fuel running vehicles make a ton of contamination and due to that we are getting such countless sicknesses and on the off chance that we take a gander at the state of our capital city Delhi, it is extremely challenging for us to take in the outside air. So here the straightforward way is that we ought to now move towards the electric vehicle as they are eco-accommodating and don't make contamination.
- Electric vehicle additionally saves us from commotion contamination since they have next to no sound in contrast with fuel running Vehicles.
- Government needs to pay such a lot of expenses for buying raw petroleum from different nations that can likewise be diminished assuming that we utilize electric vehicles.
- Also because of government schemes like Faster Adoption and Manufacturing of Hybrid & Electric Vehicles in India (FAME), National Electric Mobility Mission Plan (NEMMP) Electric vehicle manufacturers and people who are willing to buy are getting incentives, tax benefits and many other facilities.

6.3 Growth of Electric vehicles in India

The worldwide electric vehicle (EV) market is creating at a quick speed. As per EV volumes, in General Electric vehicle arrived at a worldwide portion of 8.3% (remembering battery electric vehicles [BEVs] and Plug-for half breed electric vehicles [PHEVs]) in 2021 from 4.2% in 2020 with 6.75 million vehicles out and about. This is an increment of 108% starting around 2020. EVs are acquiring consideration across the globe as

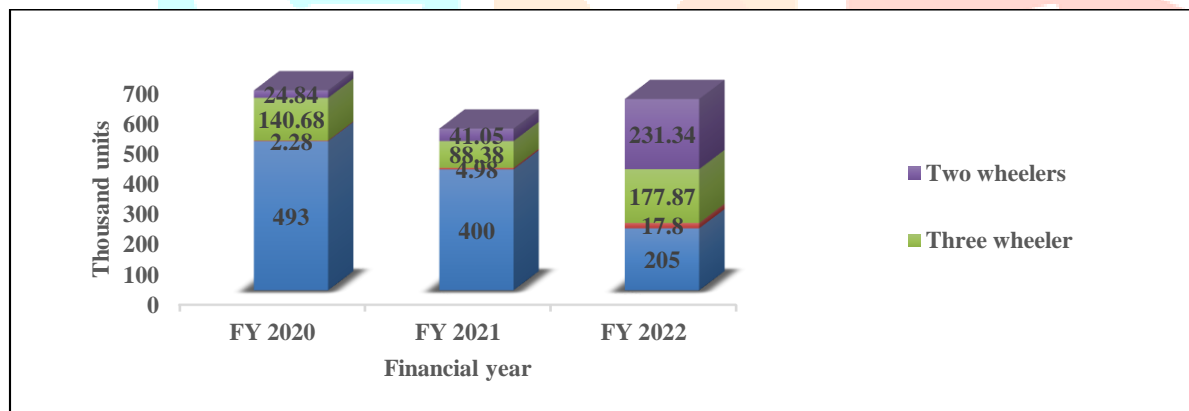
they assist with diminishing emanations and exhaustion of natural resources. The Indian EV market is additionally developing quick as near 0.32 million vehicles were sold in 2021, up 168% year over year. Continuous electric vehicle reception in India depends on the Paris consent to decrease fossil fuel by-products, to further develop the air quality in metropolitan regions and lessen oil imports.

Sales of electric vehicles across India from financial year 2020 to 2022

Table no: 1

FY/Vehicle type	Four wheelers commercial	Four-wheeler passenger	Three-wheeler	Two wheelers
FY 2020	493	2.28	140.68	24.84
FY 2021	400	4.98	88.38	41.05
FY 2022	205	17.8	177.87	231.34

Figure no: 1

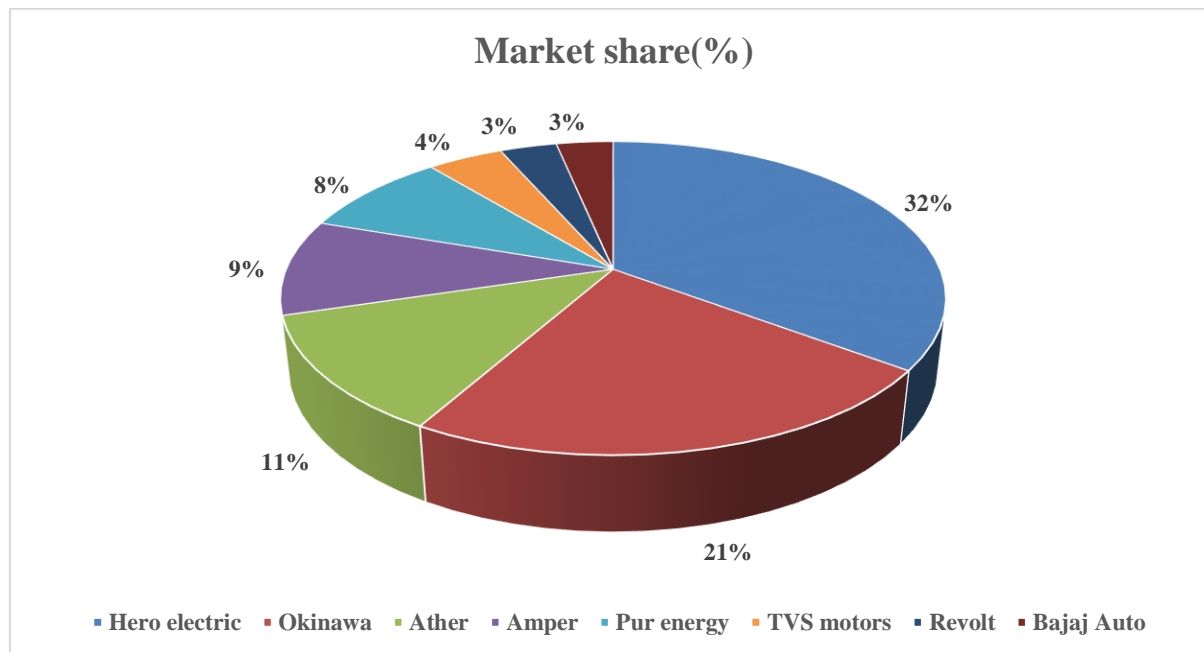


Electric two wheelers company wise market share in India

Table no: 2

Companies	Market share (%)
Hero electric	32%
Okinawa	21%
Ather	11%
Amper	9%
Pure energy	8%
TVS motors	4%
Revolt	3%
Bajaj Auto	3%

Figure no: 2



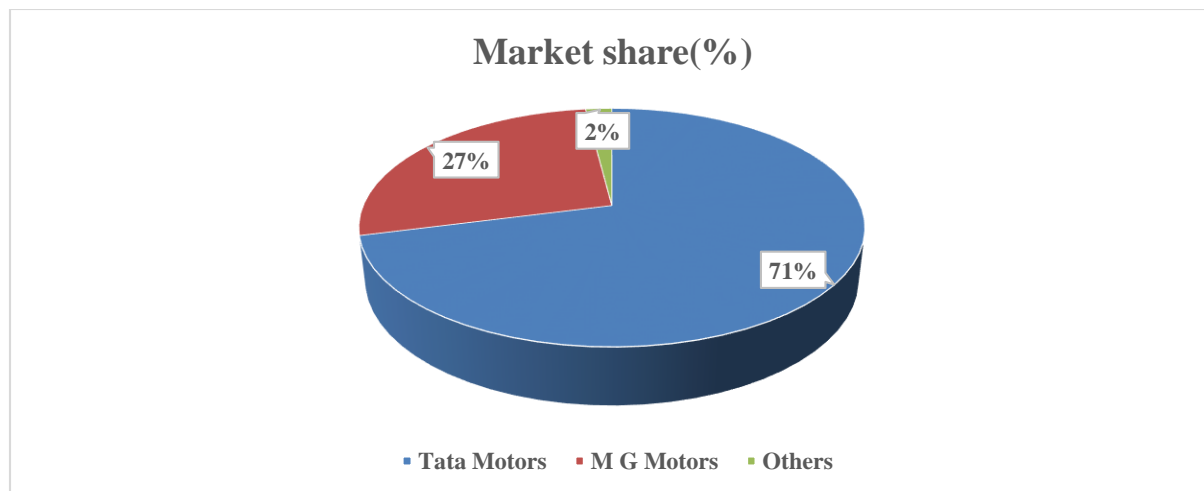
Hero Electric, Okinawa and Ather Energy control the electric bike market in India with a joined piece of the share of 64%. Hero Electric has a portion of the overall industry of 36% followed by Okinawa with 21%. Ather Energy with a 11.1% portion of the overall industry is gradually acquiring shares, as the organization is presently growing its network across India.

Electric Passenger vehicles company wise share in India

Table no: 3

Company	Market share (%)
Tata Motors	71%
M G Motors	27%
Others	2%

Figure no: 3



In the traveller vehicle section, Tata Motors partakes in a telling situation in electric vehicle space with a piece of the pie of 71%, drove by their two key models, Nexon and Tigor EV. MG Motors India partakes in the subsequent position and offers the longest-range EV (MG EZS gives 439 KM range on a solitary charge). Other Indian makers have declared their models and are supposed to be sent off from now on.

6.4 REGULATORY FRAME WORK TO ENCOURAGE E-VEHICLES USE IN INDIA

Incentives and encouraging schemes central government

1) FAME and FAME II under NEMMP

In 2012, the "National Electric Mobility Mission Plan (NEMMP) 2020" was announced as a development to the Automotive Mission Plan (AMP) 2006-2016. In any case, the task didn't take off as arranged because of an assortment of factors, including innovation, materials accessibility, neighbourhood information and market acknowledgment. Under this arrangement, the main period of FAME was executed in April 2015 and stretched out through March 31, 2019. FAME II was carried out from April 1, 2019 for 3 times. FAME is fundamentally an interest side of incentive scheme (60% of complete funds) with an emphasis on innovation improvement, framework creation, and supporting interest through subsidies and pilot projects. Electric and hybrid technology advancements, including, areas of mixture hybrid, and battery electric vehicles, are covered under this strategy.

FAME had an underlying financial plan of INR 8950 million (\$127 million) and gave a 33% discount on the contrast between the cost of an EV and a similar petroleum vehicle in urban communities with a population of more than 1 million people. The sponsorships went from INR 1800 (\$25) for a bike to INR 6, 60,000 (\$9,400) for a transport (with a most extreme constraint of 100 transports for each city) and included INR 150 million (\$2.1 million) for charging foundation per city. The GST on the acquisition of BEV was additionally brought from 28% down to 12%, determined to have EVs address 30% of complete vehicles by 2030.

FAME II has a financial plan of INR 100,000 million (\$1.4 billion), with roughly 86% going towards request incentives and 10% toward the improvement of charging stations. This stage means to give appropriations to 7000 electric transports, 55,000 four-wheeled traveller vehicles (counting strong hybrids), 500,000 three-wheeled vehicles, and a million two wheeled vehicles.

This strategy likewise upholds around 2,700 charging stations in the biggest urban communities, different urban areas with more than 1,000,000 in population, smart city areas, and urban areas in hilly states the nation over, with the goal of having no less than one charging station in each 3 km x 3 km grid. Likewise, charging stations are made arrangements for each 25 km on expressways

2) EXTENDED PLI SCHEME NOV 2020

The Production Linked Incentive (PLI) scheme gives supply side motivating incentives to domestic makers in view of gradual income. Unfamiliar organizations are welcome to set up plants in India and neighbourhood organizations are urged to set up or grow existing production lines.

On November 11, 2020, the PLI scheme was reached out to 10 extra areas including the Automobiles and Components area. The all out spending plan for these projects is INR 1,960,000 million (\$26 billion). By and large, 5% of the creation esteem is given as an incentive, so the PLI scheme looks to help \$520 billion of manufacturing over of five years, out of which INR 570,420 million (\$8.1 billion) is allocated for automobiles and auto parts, and INR 181,000 million (\$2.6) for battery manufacturing.

The PLI scheme for advanced chemistry cell (ACC) battery production was also endorsed on November 11, 2020, in this significant push for EV vehicles. Since battery expenses can include up to half of the expense of the absolute vehicle, a better battery science can possibly diminish the cost while utilizing cutting edge and more secure innovation. Producers that accomplish 60% worth added in something like five years of task beginning will be qualified for the endowment. Any new innovation that advances throughout the following

10 years is likewise qualified for the endowment. Organizations arranging or starting lithium-particle battery producing projects in Gujarat incorporate Tata Chemicals Ltd, the consortium of Suzuki Motor Corporation-Toshiba Corporation-Denso Corporation, Exide, and Amara Raja. Manikaran Power Limited intends to set up a lithium extraction processing plant in Sanand or Dholera in Gujarat.

3) VEHICLE SCRAPPAGE POLICY

The Vehicle Scrap page Policy was reported in the Union Budget in February 2021. It plans to decrease India's oil imports through more noteworthy sending of new eco-friendly vehicles; to lessen natural and clamor contamination; to further develop street and vehicular security by eliminating old, risky and temperamental vehicles; to help the accessibility of minimal expense reused inputs like plastic, steel, aluminium, steel, elastic, and hardware for the OEMs. Through the execution of this strategy alone, the vehicle business can possibly build its income to INR 10,000,000 million (\$142 billion) from the on-going INR. 4,500,000 million (\$64 billion).

Incentives and encouraging schemes by state government

STATE GOVERNMENT EV PROMOTION POLICIES

Over 14 of India's 28 states have concluded or are currently finishing EV policies that help the public electric portability strategies. Andhra Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, New Delhi, Tamil Nadu, Telangana, Uttarakhand, and Uttar Pradesh are among the states that have supported EV approaches. Among the states with draft policies are Bihar, Gujarat, Himachal Pradesh, and Punjab. Practically all state EV approaches focus on two-and three-wheelers, public transportation, and occupation creation. In any case, the approaches vary as far as targets, supply side incentives (Manufacture), and request side motivators (buyer and charging framework speculations).

State wise incentives on Electric two wheelers

Table no: 4

State	Per KWH of battery capacity	Max subsidy	Road tax exemption
Delhi	Rs 5,000	Rs 30,000	100%
Maharashtra	Rs 5,000	Rs 25,000	100%
Meghalaya	Rs 10,000	Rs 20,000	100%
Gujarat	Rs 10,000	Rs 20,000	50%
Assam	Rs 10,000	Rs 20,000	100%
Bihar	Rs 10,000	Rs 20,000	100%
West Bengal	Rs 10,000	Rs 20,000	100%
Rajasthan	Rs 2,500	Rs 10,000	NA
Odisha	No	Rs 5,000	100%
Uttar Pradesh	No	No	100%
Kerala	No	No	50%
Karnataka	No	No	100%

Tamil Nadu	No	No	100%
Telangana	No	No	100%
Madhya Pradesh	No	No	99%
Andhra Pradesh	No	No	100%
Punjab	No	No	100%

Karnataka's policy and incentives on E Bikes and E Vehicles

In this case Karnataka stands far front from other states in terms of encouraging and giving various incentives to EV manufacturers like 15% capital subsidy, 100% exemption on stamp duty and exemptions from electricity charges (for 5 years), 50-acre land providence for large projects.

But for customers only road tax is exempted no incentives are given like Maharashtra, Delhi, Rajasthan, Assam, Bihar and so on but in future its been expecting to take make good move to encourage e vehicle usage in Karnataka by giving more incentives to consumers.

Incentives given by Karnataka government to E V manufacturers

Capital Subsidy

Investment promotion subsidy:

- (a) Micro - 25% value of fixed assets (VFA) – up to INR 15 lakh
- (b) Small, with up to INR 40 lakh - 20% VFA
- (c) Medium – up to INR 50 lakh; Investment subsidy (EV cell/ battery/ module manufacturing): 20% VFA - first 2 units

Electricity duty exemption - 100%

Land Conversion Fee/Subsidy - 100%

SGST Reimbursement - 100%

Stamp duty exemption - 100%

Others

- Concessional Registration Charges: INR 1 per INR 1000
- Capital subsidy for ETP:
- (a) MSME - 50% - up to INR 50 lakh
- (b) Large/Mega/Super mega - 50% - up to INR 200 lakh

Other measures taken by governments are

- **Green registration number plate:**

This tag helps with offering special treatment to zero-emission vehicles, like free parking, free confirmation in clogged regions, and a decreased cost for roadways. The government of India has suggested a unique green number plate for every electric vehicle in the country. The focal government has now mentioned state transportation organizations to make it compulsory for all electric vehicles to have green number plates, no matter that when they were bought.

- Interest free loans for purchasing electric vehicles.
- Free first-time registration of electric vehicle.
- Tax deduction on payable tax for buying electric vehicles.

6.5 BENEFITS OF ELECTRIC VEHICLES OVER PETROLIUM VEHICLES

Transport is an essential prerequisite of current life, however the customary burning motor is rapidly becoming obsolete. Petroleum or diesel vehicles are exceptionally dirtying and are immediately supplanted by completely electric vehicles. Completely electric vehicles (EV) have zero tailpipe outflows and are vastly improved for the climate.

Benefits to environment-

1. EVs can deliver zero tailpipe discharges.

Full electric vehicles needn't bother with a tailpipe, as they don't deliver exhaust. Customary motors combust fuel or diesel, making energy at the expense of delivering destructive fossil fuel by-products. On the other hand, the batteries found in EVs are totally emanation free. The most well-known sort of battery utilized in EVs is the lithium-particle battery. These batteries can be exhausted and charged over and again without adding to air contamination.

2. In any event, while utilizing petroleum, EVs offer less discharges than Internal Combustion engine vehicles. Numerous electric charging stations utilize environmentally friendly power to charge EVs. Be that as it may, some are as yet controlled by coal-consuming power plants and comparative energy sources considered unsafe to the climate. In nations that fundamentally use coal, oil, or petroleum gas for power, charging EVs can leave a huger carbon impression.

However, in any event, when EVs are coal-controlled, they actually lead to bring down discharges by and large Nations dependent on coal, such as China, have experienced a 20% decrease in emissions of substances harmful to the ozone layer due to the use of electric vehicles. For nations that depend even less on petroleum products, clean energy sources permit EVs to be much greener.

3. Less Particulate

The fossil fuel vehicles, even the new ones, discharge a lot of wellbeing unsafe molecule contamination. The discharge of these particles can have different grave health outcomes, which incorporate asthma, coronary episodes and malignant growth and numerous different illnesses. The electric vehicles in the meantime are not straightforwardly radiating these particulates into the road air.

4. Shortening Noise Pollution

Electric engines are by and large exceptionally peaceful, especially in examination with the ICE vehicles and their fumes frameworks and hence produce less commotion contamination. While gas and diesel vehicles might be consolidated with suppressing gadgets to check the clamour the suppressors are frequently noisier than their stock partners.

5. Energy Efficiency

According to efficiency, Electric vehicles convert more than 77% of the electrical energy from the grid to drive at the wheels. Traditional gas vehicles in the meantime, just proselyte around 12%-30% of the energy put away in gas to drive at the wheels. Hence Electric Vehicles contribute towards less energy-misfortune when contrasted with internal combustion motors.

Electric vehicles, having less parts to pipe energy through, go through less energy transformation. This outcome in less energy misfortune contrasted with internal combustion motors. The electric vehicle brakes have regenerative slowing down rather than ICE vehicles. This permits the vehicle to charge the battery while slowing down as the vehicle runs on a generator which assists it with re-establishing some squandered energy back into the battery rather than utilizing a brake cushion which changes over grating into heat.

6. Late evening charging prompts cleaner energy

With the general energy utilization being lower in the evenings, it's the point at which the wind age is most prominent in the energy blend. In this way charging during the evenings prompts electric vehicles aiding the gobbling up of better measures of renewables. Close by this, it likewise fills in as a protect for balancing out the power framework.

BENEFITS TO CUSTOMERS

1. Low Maintenance Cost

The primary reason to consider purchasing an EV is the lower maintenance costs compared to traditional vehicles with internal combustion engines, due to their simpler design and operations.

2. EVs have NO clamor of their own

An additional advantage of owning an EV is its quiet operation, as there is no engine noise due to the absence of an internal combustion engine. EVs provide a more comfortable ride compared to traditional vehicles, despite the quietness of their cabins, which may require manufacturers to add artificial sounds for pedestrian safety.

3. Low Running Costs

One major advantage of EVs compared to conventional IC engine vehicles is their lower running costs. For instance, the Hyundai Kona can travel approximately 450 kilometres on a single charge, resulting in a cost of less than one rupee per kilometre. This cost efficiency stands out as a significant benefit of owning an EV, especially in India.

4. No more fuel cost hike

Worried about fluctuating fuel costs? With an EV, you can say goodbye to the daily hassle of petrol and diesel price changes. No longer dependent on fuel, you can enjoy worry-free driving regardless of global fuel price fluctuations.

5. Advantageous Charging at Home

EVs offer a notable advantage over traditional vehicles, especially during peak hours at fuel stations or when running late for work. With the convenience of home charging taking just 4-5 hours, your residence becomes your personal fuel station. Plus, modern EVs feature fast charging, replenishing the battery in just 60 minutes if needed.

6. Simple to drive

All electric vehicles, including electric bikes and buses, are gearless, simplifying the driving experience. With no need to operate gear systems, driving an EV is a sheer pleasure, requiring only the use of buttons or pedals to control speed. Even if you think automatic petrol/diesel cars offer similar comfort, EVs have additional advantages worth exploring.

2. Agreeable Cabin and More Storage Options

We realize we have previously referenced that the lodge is quiet yet assuming you go for an EV, you will get better legroom as well. Albeit, the front segment can offer you a superior extra room in light of the fact that the stuff switch isn't there, the back part of the lodge gets you a level floor which is the reason the traveller in the center can likewise take in the scenery without limit! The capacity choices additionally increment, there can be capacity choice in the front in the engine as there is no motor this time. Engines and batteries don't accept a lot of room when contrasted with the motors

3. .EVs are future confirmation

Taking into account where we are going to, EVs are the main future we can turn upward to! The non-renewable energy sources are going to end whenever and it's anything but a fair choice to debilitate every one of the petroleum products while we carry on with our life. Power is likewise created from petroleum products however we are gradually moving towards sustainable wellsprings of energy which is certainly what's in store! We have sunlight based energy and wind energy which are sustainable and don't cause contamination as well! EVs are the future and we should become accustomed to it in the present as well.

BENEFITS TO THE NATIONAL ECONOMY

1. Employment opportunity creation

The present un employment rate is 7.6 percent. If e vehicles are manufactured domestically so many of youngsters will get job opportunity. In other side new innovations in sectors like battery development, spare parts manufacturing sectors, charging infrastructure installation. There will be a high need for human resource it leads to creation of more employment opportunity in the nation.

2. Less dependence on other countries

As we know we always need someone’s dependence it also apply to individual person and to countries. As per some statistics in the year of 2021-22 India has imported 212 million tones of crude oil which is worth around 101 billion U S dollars. The estimation says that our nation needs 2.4 million barrels of crude oil. Where we are depending 84% of oil need from importation outside the country most of the importation is happening from eastern countries like Saudi Arabia, Iran, qatar and some other gulf countries. These kind of dependence on other countries can ruin nation’s economy if the relationship collapse between the country by some un expected reasons like war, political mismatched agendas so on.

When country turns its key sector which is transportation to electric based system or e vehicles the country will turn to self-dependence it could be a great boost for economy of the nation.

3. Large investment from foreign countries

Because of privatisation and liberalisation foreign investors are coming to invest in India. All investors thinks that India is having most favourable environment to manufacture e vehicles we have largest qualified human resource in the world, also manufacturer friendly policies. So all of above reasons are attracting foreign direct and indirect investments in India.

In the upcoming days this EV manufacturing industry is going to big contribution to our there is no doubt in that.

7. DATA ANALYSIS AND INTERPRETATION

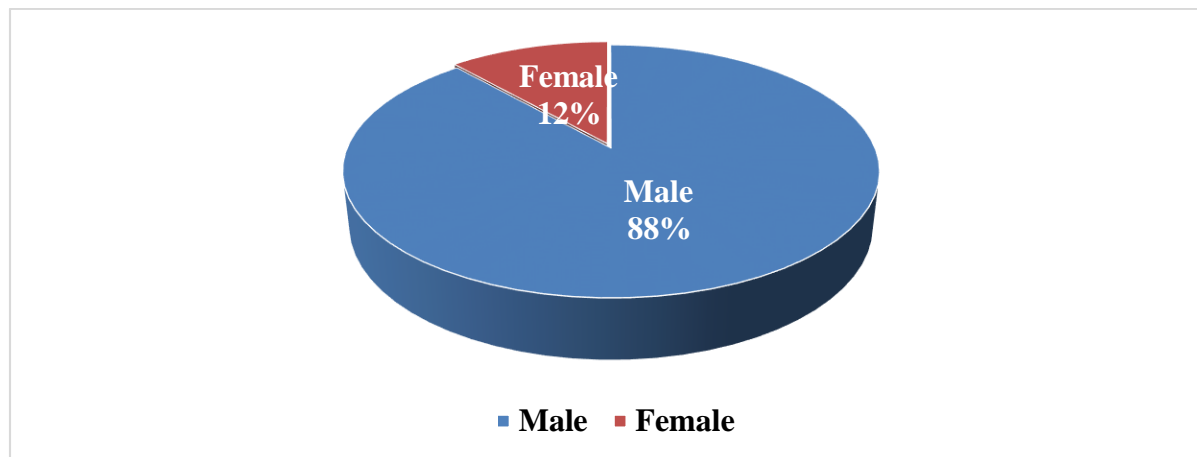
1. GENDER WISE CLASSIFICATION OF THE RESPONDENTS.

TABLE NO: 5

Gender	No of respondents	Percentage (%)
Male	92	88%
Female	12	12%
Total	104	100%

FIGURE NO: 4

GENDER WISE CLASSIFICATION OF THE RESPONDENTS.



Interpretation: From the above table and chart, we could easily get the information that our study is consisting total sample of 104 e bike riders. Out of the 104 samples 88% of sample is Male (92) and 12% of sample is female (12).

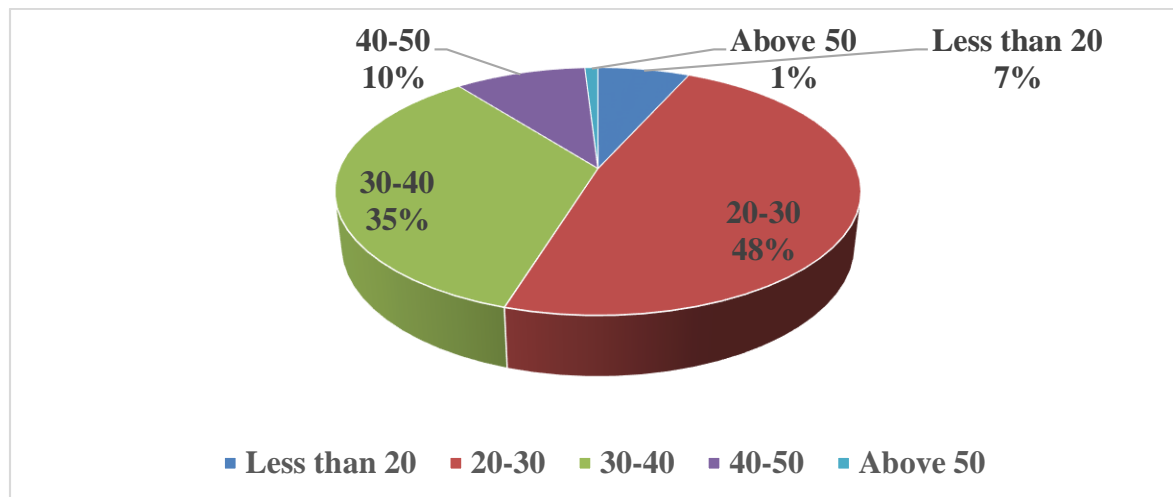
2. AGE RANGE OF RESPONDENTS.

TABLE NO: 6

Age range	No of respondents	Percentage (%)
Less than 20	07	07%
20-30	50	48%
30-40	36	35%
40-50	10	10%
Above 50	01	01%
Total	104	100%

FIGURE NO: 5

AGE RANGE OF RESPONDENTS.



INTERPRETATION:

The above table and chart deliver the information that, out of 104 respondents 48% (50 respondents) belongs to the age category of 20 to 30, 35% (36 respondents) are from 30 to 40 age category, 10% (10 respondents) are from age category of 40 to 50 and 7% (07 respondents) from age of less than 20, 1%(01respondents) Of sample is from age range of above 50.

3. BRAND OF ELECTRIC BIKES OWN BY RESPONDENTS.

TABLE NO: 7

BRAND OF THE E BIKE	NO RESPONDENTS	OF PERCENTAGE (%)
Ampere	16	15.4%
Ola	11	10.6%
Hero	10	9.6%
Ather	09	8.7%
Avon	08	7.7%
Pure E V	07	6.7%
Okinawa	06	5.8%
Revolt	05	4.8%
Re one	04	3.8%
Battery plus	04	3.8%
Simple one	03	2.9%

Eko cosmic	03	2.9%
Gaura electric	03	2.9%
Bajaj	03	2.9%
Yo style	02	1.9%
Joy e	02	1.9%
Dangling pro	02	1.9%
Kabira	02	1.9%
Reo	02	1.9%
Tvs	01	1.0%
Green bike	01	1.0%
Total	104	100%

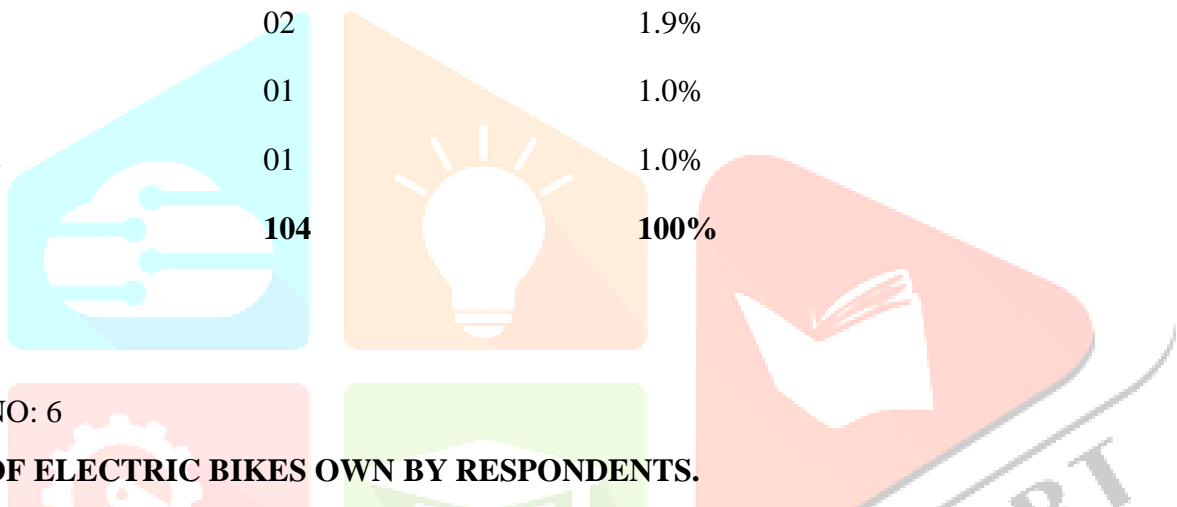
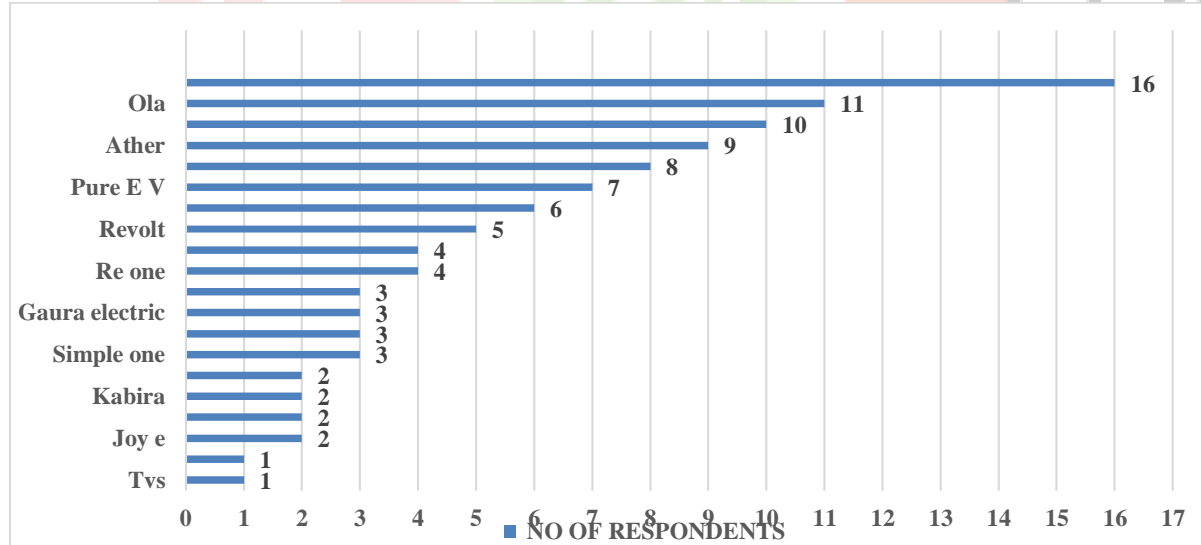


FIGURE NO: 6
BRAND OF ELECTRIC BIKES OWN BY RESPONDENTS.



INTERPRETATION:

From the data table and chart, they are showing that out of 104 respondents 15% (16 respondents) are using Ampere electric bike, 11% (11 respondents) are using Ola electric bike, and Hero bike is being used by 10 % respondents. 9% respondents are using Ather bikes, 8% of respondents are using Avon electric bikes, 7% respondents having Pure ev electric bikes, Okinawa bikes 6% and Revolt bikes are being used by 5% respondents each. 4% respondents are using Battery plus, Re one. Guara electric, Eco cosmic, Simple one, Bajaj brand bike are used by 3% respondents each. Yo style, Joy e, Dangling pro, kabira brands are being used by 2% of respondents. Tvs, Green bike has 1% share each.

4. TIME DURATION OF USING E BIKE BY RESPONDENTS.

TABLE NO: 8

Time duration	No of respondents	Percentage (%)
1 year	23	22.1%
07 months	11	10.6%
08 months	08	7.7%
03 months	07	6.7%
2 years	05	4.8%
1 year 8 months	05	4.8%
11 Months	05	4.8%
09 Months	05	4.8%
06 months	05	4.8%
05 months	05	4.8%
1 year 3 months	04	3.8%
04 months	04	3.8%
1 year 4 months	03	2.9%
1 year 2 months	03	2.9%
02 months	03	2.9%
1 year 7 months	02	1.9%
1 year 6 months	02	1.9%
1 year 5 months	02	1.9%
01 month	01	1.0%
Total	104	100

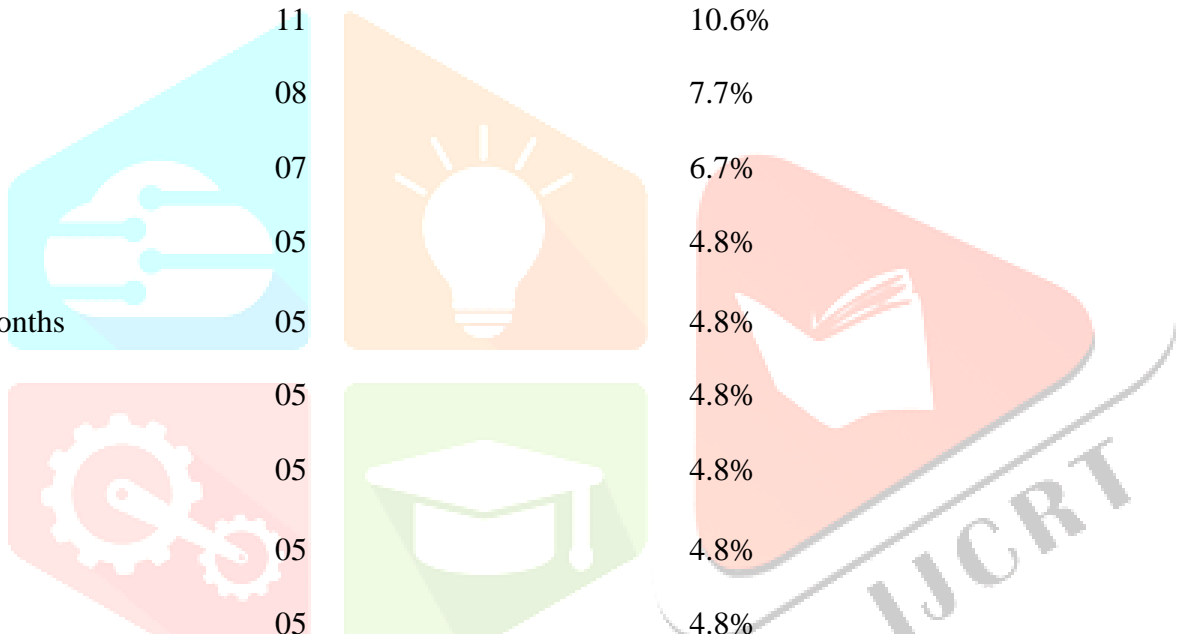
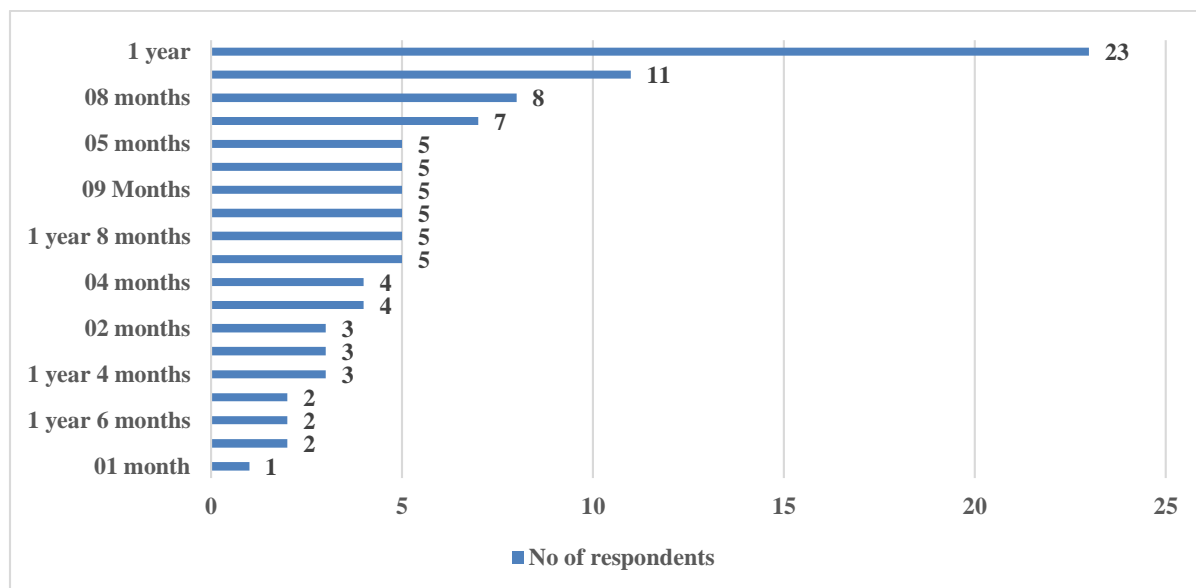


FIGURE NO: 7

TIME DURATION OF USING E BIKE BY RESPONDENTS.



INTERPRETATION:

From the data available in the above table and chart, we can easily observe that out of 104 respondents most of the respondents are using e bikes from last 1 year this category makes over 22% (22 respondents), second highest duration is 7 months which acquires 11% (11 respondents) and 8% respondents are using e bikes since last 8 months and remaining respondents are using different time duration like 2 years - 05%, 1 year 8 months - 05%, 1 year 7 months - 02%, 1 year 6 months - 02%, 1 year 4 months - 03%, 1 year 5 months - 02%, 1 year 3 months - 04%

1 year 2 months - 03%, 11 Months - 05%, 09 Months - 05%, 08 months - 08%, 06 months - 05%, 05 months - 05%, 04 months - 04%, 03 months - 07%, 02 months - 03%, 01 month - 01% like this the respondents are shared the percentage in the chart.

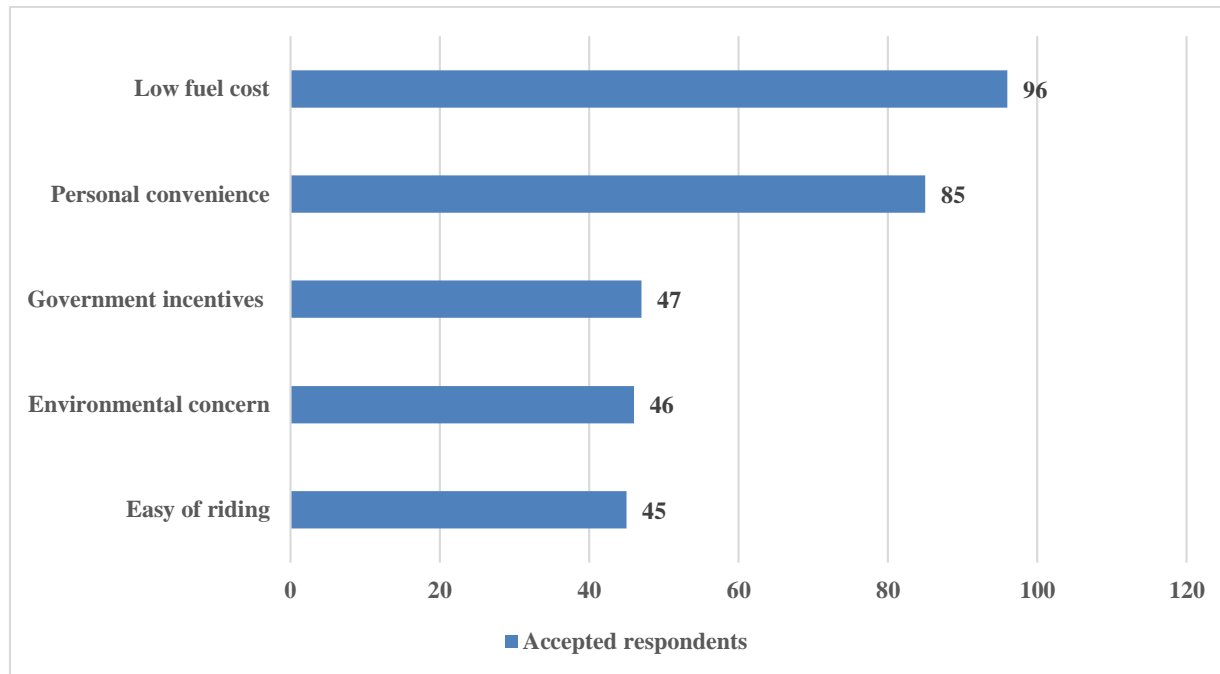
5. REASONS FOR BUYING E BIKES BY RESPONDENTS.

TABLE NO: 9

Reasons	Accepted respondents
Low fuel cost	96
Personal convenience	85
Government incentives (Non requirement of licence, free vehicle documentation)	47
Environmental concern	46
Easy of riding	45

FIGURE NO: 8

REASONS FOR BUYING E BIKES BY RESPONDENTS.



INTERPRETATION:

From the above data table and chart, it is understood that 96 respondents out of 104 respondents accepted the reason for buying e bike is because of low fuel cost. 85 respondents out of 104 respondents says that the reason for buying e bike is because of personnel convenience. 47 respondents have chosen e bike because of government incentives and 46 respondents have said that environmental concern is their motivation for buying e bike, 45 respondents told the easiness of riding e bike is the reason for purchase of e bike.

6. DISTANCE OF E BIKE RIDING BY RESPONDENT PER DAY.

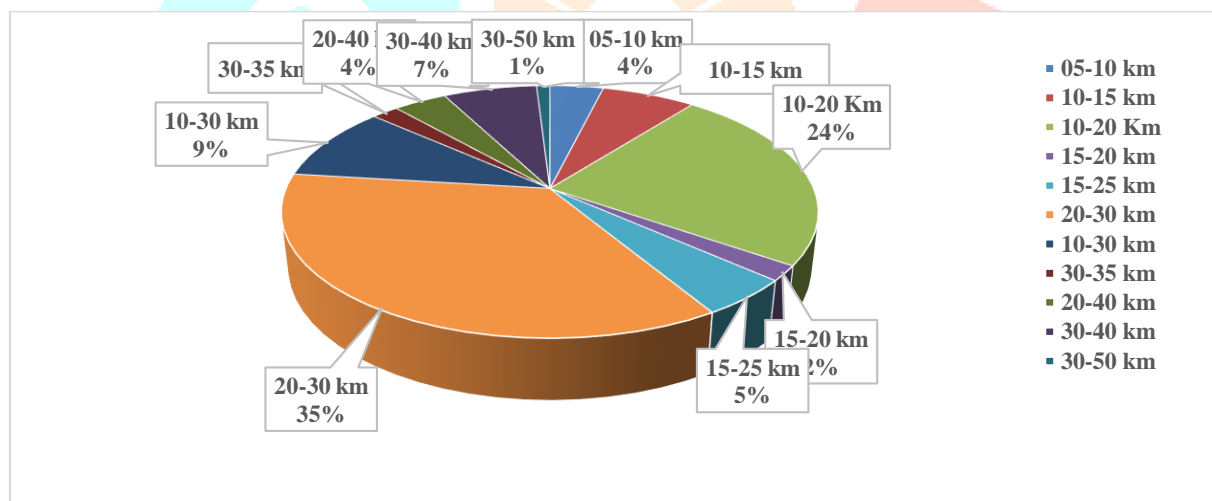
TABLE NO: 10

Distance per day	No of respondents	Percentage (%)
20-30 km	37	36
10-20 Km	25	24
10-30 km	10	09
10-15 km	07	07
30-40 km	07	07
15-25 km	05	05
05-10 km	04	04
20-40 km	04	04
15-20 km	02	02
30-35 km	02	02

30-50 km	01	01
Total	104	100

FIGURE NO: 9

DISTANCE OF E BIKE RIDING BY RESPONDENT PER DAY.



INTERPRETATION:

The above data table and chart shows that majority of the respondents that is 36% of the respondents out of 104 respondents uses their e bike for riding the distance between 20 to 30 km range every day. 24% of respondents ride the bike within distance of 10 to 20 km, 9% respondents ride the e bike between 10 to 30 km, 7% respondents rides in the minimum range of 30 to 40 km another 7% of respondents covers the distance in the range of 10 to 15 km and rest of the samples make over the further gap like 5% 15 to 25 km, 4% 5 to 10 km, 4% 20 to 40 km, 2% 30 to 35 km, 2% 15 to 20 km, 1% 30 to 50 km.

7. OPINION OF RESPONDENTS ON PRICE OF E BIKES.

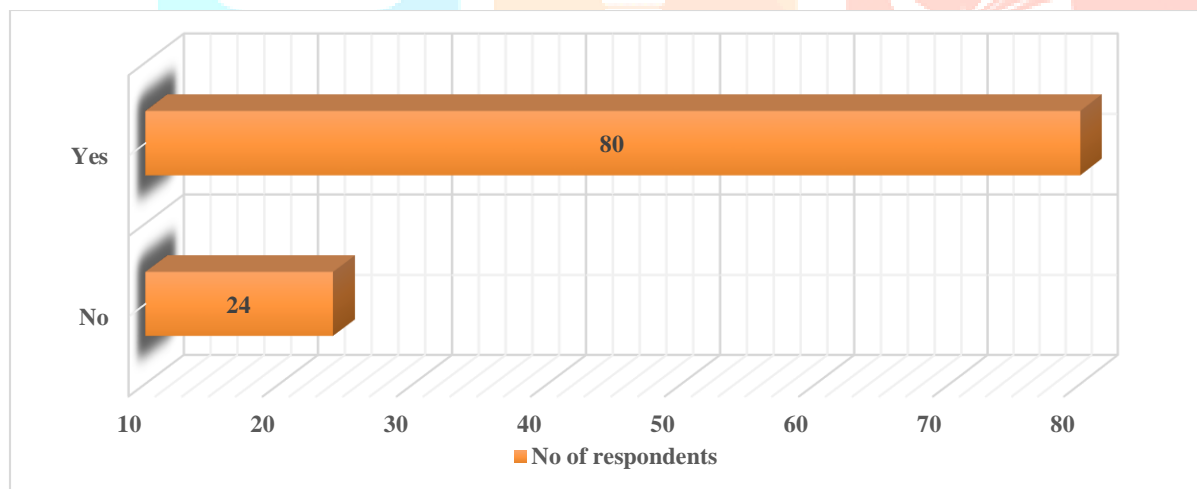
TABLE NO: 11

“Price of the e bike is reasonable”

Particulars	No of respondents	Percentage (%)
Yes	80	79
No	24	21
Total	104	100

FIGURE NO: 10

OPINION OF RESPONDENTS ON PRICE OF E BIKES



INTERPRETATION:

By the above the table we have noticed that 79% (80 respondents) of the respondents out of 104 respondents accepts that the price of the e bikes are reasonable it means they are satisfied with price of e bikes meanwhile 21% (24 respondents) of the respondents don't think that the price of e bikes are reasonable it means they are not satisfied with the price of the e bikes.

8. EASYNES OF RIDING E BIKE COMPARING TO NORMAL GEARED FUEL BASED BIKE.

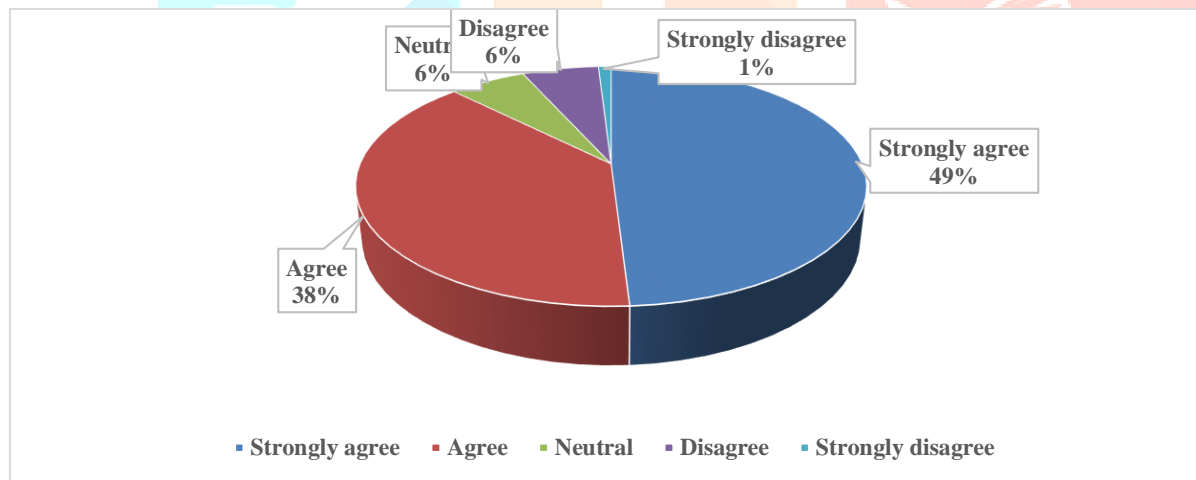
TABLE NO: 12

“Riding an e-bike is easier than riding a normal petrol-based geared bike.

Particulars	No of respondents	percentage
Strongly agree	51	49
Agree	40	38
Neutral	06	06
Disagree	06	06
Strongly disagree	01	01
Total	104	100

FIGURE NO: 11

EASYNES OF RIDING E BIKE COMPARING TO NORMAL GEARED FUEL BASED BIKE.



INTERPRETATION:

The above table and chart shows that out of 104 respondents 49% (51) of respondents strongly agree that e bikes are easy to ride while comparing to normal fuel based geared bikes. 38% (40) of respondents agreed, and 6% respondents are being neutral, 6% of respondents disagrees and saying that riding e bike is not easy to ride, 1% respondents also told e bike isn't easy to ride while we comparing to normal fuel based geared bikes.

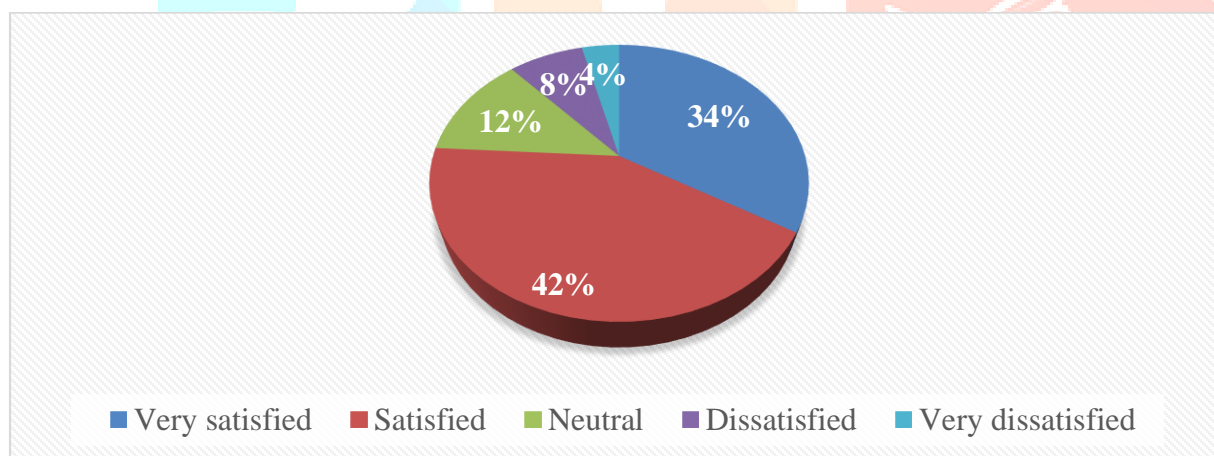
9. SPEED SATISFACTION OF E BIKES.

TABLE NO: 13

Particulars	No of respondents	Percentage (%)
Very satisfied	35	34
Satisfied	44	42
Neutral	13	12
Dissatisfied	08	08
Very dissatisfied	04	04
Total	104	100

FIGURE NO: 12

SPEED SATISFACTION OF E BIKES.



INTERPRETATION:

The table at the top of the page shows that 42% of respondents out of 104 respondents satisfied with the e bike speed and 34% of respondents are very satisfied, 12% respondents were stayed Neutral about their speed satisfaction level. 8% respondents are dissatisfied, 4% respondents are very dissatisfied.

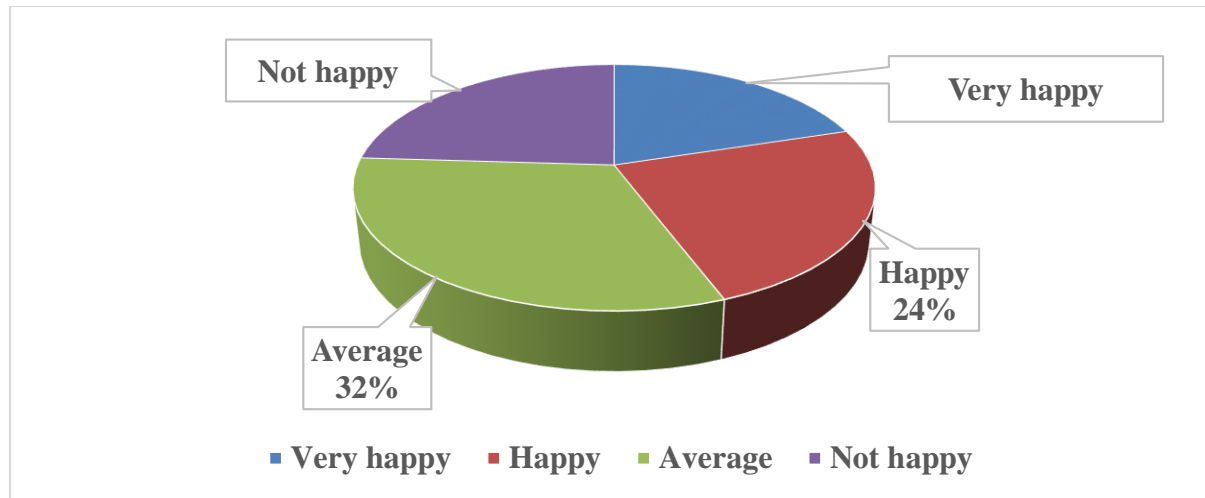
10. MILEAGE SATISFACTION OF E BIKES.

TABLE NO: 14

Particulars	No of respondents	Percentage (%)
Very happy	21	20
Happy	25	24
Average	33	32
Not happy	25	24
Total	104	100

FIGURE NO: 13

MILEAGE SATISFACTION OF E BIKES.



INTERPRETATION:

Above table and chart gives us information about the level of mileage satisfaction of 104 e bike respondents. Out of the 104 respondents 32% of the respondents are averagely satisfied. 24% respondents are happy with their e bike mileage, 24% respondents are not happy, 20% respondents are very happy with their e bike mileage.

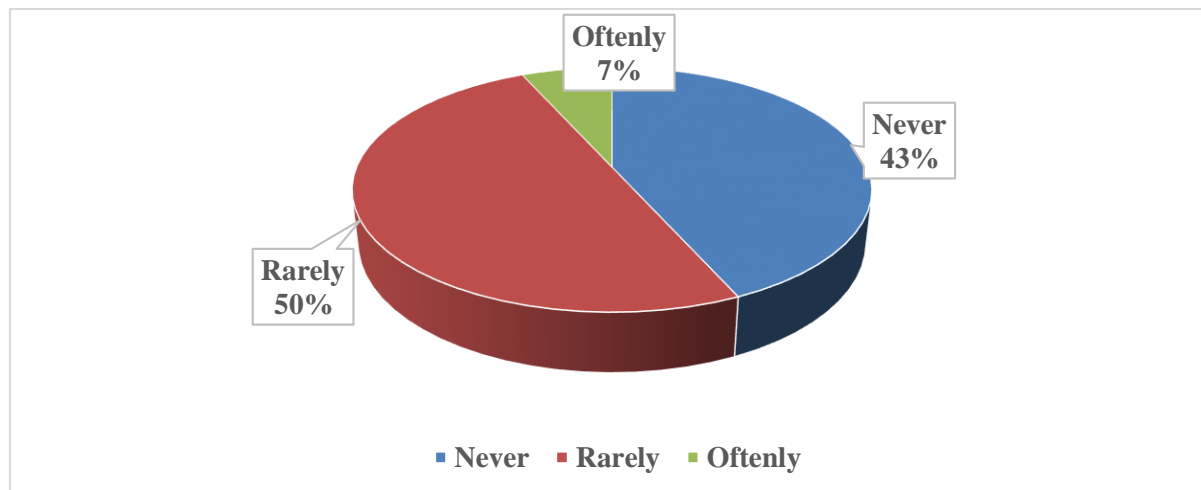
11. TECHNICAL TROUBLE FACED IN E BIKES BY RESPONDENTS.

TABLE NO: 15

Particulars	No of respondents	Percentage
Never	45	43
Rarely	52	50
Oftenly	07	07
Total	104	100

FIGURE NO: 14

TECHNICAL TROUBLE FACED IN E BIKES BY RESPONDENTS.



INTERPRETATION:

The above data table and chart reveals that details about how frequently respondents are faced technical trouble in e bikes. 50% respondents out of 104 respondents said they have rarely faced technical trouble in e bikes, 43% respondents said they have never faced technical trouble since the purchase of e bike, 7% respondents told they have faced oftenly facing technical trouble in their e bikes.

12. SATISFACTION LEVEL OF E BIKE MAINTENANCE COST.

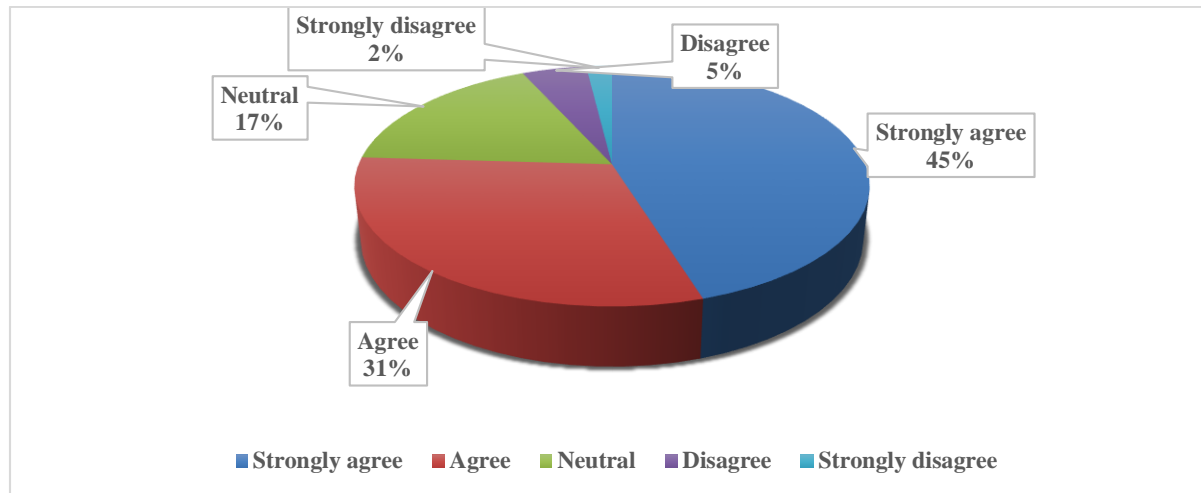
TABLE NO: 16

"Highly satisfied with maintenance cost e bike"

Particulars	No of respondents	Percentage
Strongly agree	47	45
Agree	32	31
Neutral	18	17
Disagree	05	05
Strongly disagree	02	02
Total	104	100

FIGURE NO: 15

SATISFACTION LEVEL OF E BIKE MAINTENANCE COST.



INTERPRETATION:

The above table and chart shows that out of 100 respondents 45% (47) of respondents strongly agree that their e bikes maintenance cost is highly satisfactoral. 31% (32) of respondents agreed, and 17% respondents are being neutral, 5% of respondents disagrees and saying that e bike maintenance cost is not satisfactoral , 2% respondents also told they are strongly disagreed it means they are not satisfied with e bike maintenance cost.

13. SATISFACTION LEVEL OF E BIKE RUNNING COST.

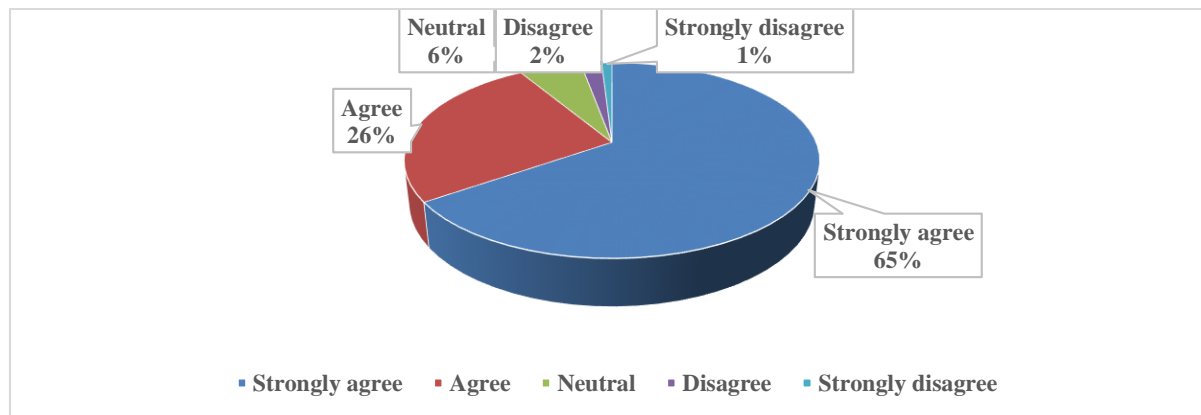
TABLE NO: 17

"E bikes running cost is far lesser than normal fuel-based bikes"

Particulars	No of respondents	Percentage (%)
Strongly agree	68	65
Agree	27	26
Neutral	06	06
Disagree	02	02
Strongly disagree	01	01
Total	104	100

FIGURE NO: 16

SATISFACTION LEVEL OF E BIKE RUNNING COST.



INTERPRETATION:

The above table and chart shows that out of 104 respondents 65% (68) of respondents strongly agree that their e bikes running cost is highly satisfactoral. 26% (27) of respondents agreed, and 6% respondents are being neutral, 2% of respondents disagrees and saying that e bike running cost is not satisfactoral , 1% respondents also told they are strongly disagreed it means they are not satisfied with e bike running cost.

14. UTILISATION OF GOVERNMENT INCENTIVES ON PURCHASING OF E BIKE.

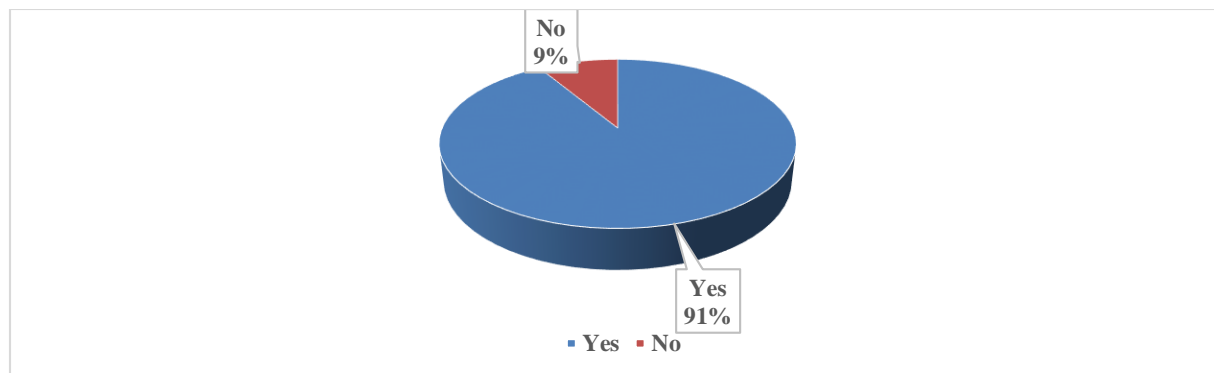
TABLE NO: 18

Did you get government incentives and company offers while purchasing e bike?

Particulars	No of respondents	Percentage (%)
Yes	95	91
NO	09	09
Total	104	100

FIGURE NO: 17

UTILISATION OF GOVERNMENT INCENTIVES ON PURCHASING OF E BIKE.



INTERPRETATION:

By the above the table, we have noticed that 91% (95 respondents) of the respondents out of 100 respondents accepts that they have utilised the incentives given by the central and state governments meanwhile 9% (09 respondents) of the respondents didn't utilise any government incentives while they were purchasing of the e bikes.

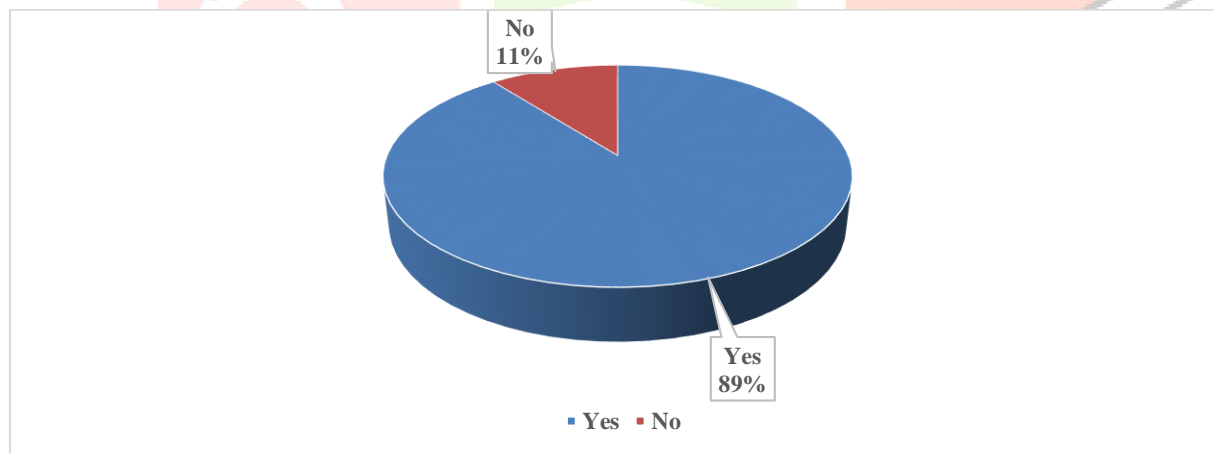
15. WHETHER RESPONDENTS RECOMMEND OTHER PEOPLE TO BUY E BIKES.

TABLE NO: 19

Particulars	No of respondents	Percentage (%)
Yes	93	91
NO	11	09
Total	100	100

FIGURE NO: 18

WHETHER RESPONDENTS RECOMMEND OTHER PEOPLE TO BUY E BIKES.



INTERPRETATION:

The above table and CHART shows that 91% (91 respondents) of the respondents out of 100 respondents said that they will recommend other people to buy e bike in the future. And 09% (09 respondents) of the respondents said they don't recommend to buy e bikes to other people in the future.

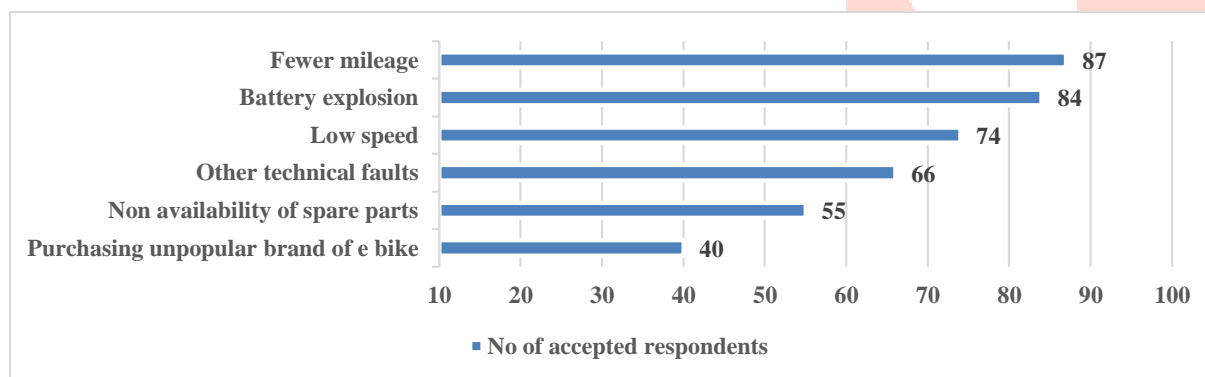
16. SITUATIONS THAT RESPONDENTS ARE AFRAID OF PURCHASING E BIKE.

TABLE NO: 20

Particulars	No of accepted respondents
Fewer mileage	87
Battery explosion	84
Low speed	74
Other technical faults	66
Non availability of spare parts	55
Purchasing unpopular brand of e bike	40

FIGURE NO 19:

SITUATIONS THAT RESPONDENTS ARE AFRAID OF PURCHASING E BIKE.



INTERPRETATION:

From the above data table and chart, it is understood that 87 respondents out of 104 respondents accepted the fewer mileage is the circumstance where they are afraid to buying e bike, 84 respondents out of 104 respondents says that the battery explosion is the reason for afraidness to having e bike of own. 74 respondents told the their afraidness about buying e bike with low-speed capacity. 66 respondents said other technical issues possibly accruable in e bikes are their reason for fear of buying e bike and 55 respondents have said that non availability of e bike spare parts, 40 respondents have told buying unpopular brand of e bike is their afraid circumstances to purchase e bikes .

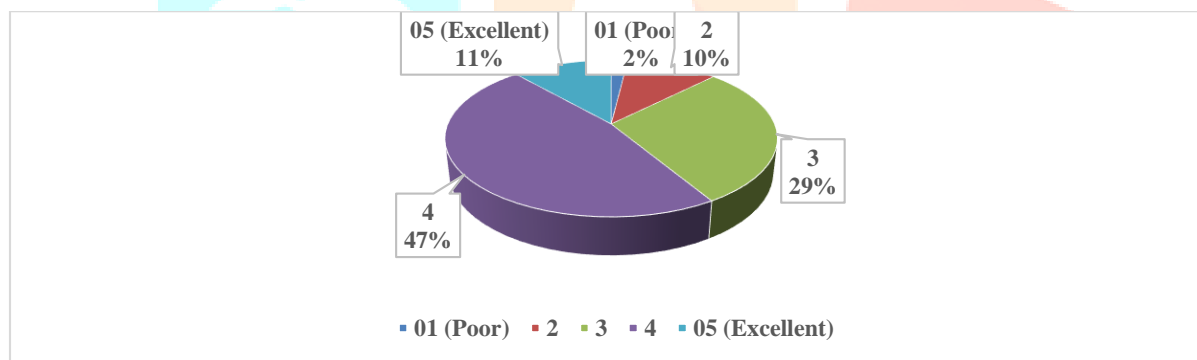
17. OVERALL SATISFACTION ABOUT E BIKES TO CUSTOMERS

TABLE NO: 21

Satisfaction level	No of respondents	Percentage (%)
01 (Poor)	02	02
02	11	10
03	30	29
04	49	47
05 (Excellent)	12	12
Total	104	100

FIGURE NO: 20

OVERALL SATISFACTION ABOUT E BIKES TO CUSTOMERS



INTERPRETATION:

Above the table and chart shows that how 100 respondents are satisfied with overall e bike performance, out of 100 respondents 47% that is 47 respondents have given 4 out of 5 rating which is said as be good performance by e bikes, 28% that are 28 respondents are given 3 out of 5 ratings which is also a good level of ratings by respondents, 12% (12 respondents) have been given 5 out of 5 rating which means the respondents are having excellent performance from e bikes, 11% of respondents have given 2 out of 5 ratings which means they have been having average performance from their e bikes and 2% respondents given least rating that is 1 out of 5 ratings, it means they are having poor performance by their e bikes which clearly shows us they are not satisfied with e bikes.

FINDINGS

Out of 104 respondents, 15% (16 respondents) are using Ampere electric bikes, 11% (11 respondents) are using Ola electric bikes, and Hero bikes are being used by 10% of respondents. 9% of respondents are using Ather bikes, 8% are using Avon electric bikes, 7% have Pure EV electric bikes, Okinawa bikes account for 6%, and Revolt bikes are used by 5% of respondents each. 4% of respondents are using Battery Plus, Re One, Guara Electric, Eco Cosmic, Simple One, and Bajaj brand bikes each. Yo Style, Joy E, Dangling Pro, and Kabira brands are being used by 2% of respondents. TVs and Green Bike each have a 1% share.

Most of the respondents, 36%, have been using e-bikes for the past year, followed by 22% who have been using them for 7 months, and 8% for 8 months. The remaining respondents have varied usage durations ranging from 2 years to 1 month.

Out of 104 respondents, 96 accept low fuel cost as the reason for buying e-bikes, 85 cite personal convenience, 47 mention government incentives, 46 cite environmental concerns, and 45 mention the ease of riding e-bikes.

Regarding daily usage, 36% of respondents ride distances between 20 to 30 km, followed by 24% within 10 to 20 km, and 9% between 10 to 30 km. Other distances are also mentioned by respondents.

Regarding pricing satisfaction, 79% find e-bike prices reasonable, while 21% do not.

Regarding ease of riding, 49% strongly agree that e-bikes are easier compared to traditional geared bikes.

Regarding speed satisfaction, 42% of respondents are satisfied, and 34% are very satisfied.

Regarding mileage satisfaction, 32% are averagely satisfied, 24% are happy, 24% are not happy, and 20% are very happy.

Regarding technical troubles, 50% rarely face issues, 43% never face issues, and 7% often face issues.

Regarding maintenance cost satisfaction, 45% strongly agree, 31% agree, and 17% are neutral, while 5% disagree.

Regarding running cost satisfaction, 65% strongly agree, 26% agree, and 6% are neutral, while 2% disagree.

Regarding government incentives utilization, 91% accepted utilizing them.

Regarding recommendation, 91% would recommend buying e-bikes, while 9% would not.

Regarding concerns, respondents fear fewer mileage, battery explosion, low-speed capacity, technical issues, non-availability of spare parts, and buying unpopular brands.

Regarding overall performance satisfaction, 47% rate it as good, 28% rate it as good, 12% rate it as excellent, 11% rate it as average, and 2% rate it as poor.

SUGGESTIONS

E-bike manufacturers should focus on improving product design for better comfort, performance, and aesthetics based on user feedback and ergonomic principles. Continued investment in battery technology is crucial to enhance battery life, charging efficiency, and overall range. Transparent pricing and clear communication about features, warranties, and after-sales support are essential to enhance customer satisfaction. Governments and private stakeholders should collaborate to expand E-bike charging infrastructure in urban and suburban areas, while providing education and training programs for users to improve riding skills and safety awareness. Building a strong E-bike community through social media and local events can foster a sense of belonging and gather feedback to enhance user satisfaction. Policymakers should consider implementing supportive policies and incentives to promote E-bike adoption and sustainable transportation options. By addressing these suggestions, stakeholders can improve the E-bike user experience and drive widespread adoption.

CONCLUSION

"In conclusion, this study has provided valuable insights into customer satisfaction towards E-bikes. The findings indicate a generally positive attitude among customers, driven by factors such as convenience, environmental benefits, and cost-effectiveness. However, it is crucial for manufacturers and policymakers to address certain challenges such as battery range, charging infrastructure, and safety concerns to further enhance customer satisfaction and promote widespread adoption of E-bikes. Future research could delve deeper into these specific areas to offer more targeted solutions and better understand evolving consumer preferences in the rapidly growing E-bike market."

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