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A STUDY ON THE CONSUMER AWARENESS TOWARDS ELECTRIC BIKES

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ABSTRACT

The growing emphasis on sustainable transportation has highlighted electric bikes (e-bikes) as a viable alternative to conventional vehicles, sparking significant interest in understanding consumer awareness, market acceptance, and adoption potential. This research paper presents a comprehensive marketing analysis of electric bikes, conducted through a survey of 100 participants across diverse demographic segments, to assess consumer knowledge, perceptions, and purchase intentions regarding e-bikes. The study aims to identify key factors influencing e- bike adoption, pinpoint target consumer segments, and evaluate the role of price sensitivity, environmental consciousness, and infrastructural accessibility in shaping purchase decisions. To ensure a robust and statistically validated analysis, the research employs multiple statistical techniques, including Analysis of Variance (ANOVA), Chi-square tests, and regression analysis. ANOVA was utilized to examine the influence of demographic variables (such as age, income, and education) on consumer awareness of e-bikes, revealing significant variations across age and income groups, with younger and higher-income respondents exhibiting greater familiarity and positive attitudes toward e-bike usage. Chi-square tests were applied to assess associations between categorical variables, such as the relationship between environmental awareness and the likelihood of purchasing an e-bike. The results indicated a strong correlation, with environmentally conscious consumers displaying higher purchase intent. Regression analysis was employed to quantify the impact of independent variables—including perceived benefits, government incentives, and cost concerns—on the dependent variable, purchase intention. The regression model demonstrated that perceived advantages, such as cost savings and eco-friendliness, significantly enhanced purchase intent, while high initial costs and limited bike lane infrastructure acted as notable barriers. The findings of this study offer valuable insights for e-bike manufacturers and policymakers, underscoring the importance of targeted marketing strategies that address cost concerns and infrastructural limitations while promoting the economic and environmental benefits of e-bikes. Strategic recommendations include expanding dedicated cycling infrastructure, introducing financial incentives, and increasing consumer education on e- bike advantages. This research lays the groundwork for future studies to further explore consumer behavior in the e-bike market, incorporating longitudinal data and larger sample sizes to refine market segmentation and optimize marketing strategies for broader e-bike adoption.

INTRODUCTION

The transportation sector in India is undergoing a significant transformation, driven by the need for sustainable and eco-friendly mobility solutions. With rising fuel prices, increasing pollution levels, and government initiatives promoting electric vehicles (EVs), electric bikes (e-bikes) have emerged as a promising alternative to conventional petrol and diesel-powered two-wheelers. However, despite their environmental and economic benefits, the adoption of e-bikes in India remains relatively low compared to traditional vehicles. One of the key factors influencing this slow uptake is consumer awareness—or the lack thereof. This study aims to explore the level of consumer awareness regarding electric bikes in India, identifying the factors that influence purchasing decisions, the challenges faced by potential buyers, and the role of government policies and marketing strategies in shaping perceptions. By analyzing consumer attitudes, preferences, and knowledge gaps, this research seeks to provide insights that can help manufacturers, policymakers, and marketers accelerate the adoption of e-bikes in the Indian market. India is one of the largest two-wheeler markets in the world, with millions of petrol- powered scooters and motorcycles sold annually. However, the shift toward electric mobility has been gradual. The Indian government has introduced several initiatives, such as the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme, subsidies, and tax benefits, to promote EV adoption. Despite these efforts, consumer hesitation persists due to factors like Limited awareness about e-bike technology, benefits, and cost savings. Range anxiety (fear of low battery life and insufficient charging infrastructure), Higher upfront costs compared to conventional bikes misconceptions about performance, maintenance, and reliability Understanding consumer awareness is

crucial because it directly impacts purchasing behavior. If potential buyers are unaware of the long-term cost benefits, environmental advantages, or technological advancements in e-bikes, they are less likely to consider them as a viable option.

The growing concern for environmental sustainability and rising fuel costs have increased interest in electric bikes (e-bikes) as an eco-friendly and cost-effective alternative to conventional two- wheelers. However, despite government incentives and technological advancements, consumer adoption of e-bikes in India remains slow. A key factor influencing this trend is **consumer awareness—many potential buyers lack sufficient knowledge about e-bike benefits, performance, charging infrastructure, and long-term savings.

This study aims to assess consumer awareness levels, identify key perceptions, and analyze factors affecting purchasing decisions regarding electric bikes in India. By examining consumer attitudes, misconceptions, and preferred sources of information, the research seeks to provide insights for manufacturers, policymakers, and marketers to enhance awareness and drive higher adoption rates. The findings will help bridge the knowledge gap and support the transition toward sustainable mobility in India.

REVIEW OF LITERATURE

(According to Dr.Amisha) There is growing demand for electric bikes in India as there will be less air pollution, lower maintenance cost and reduce noise using electric bikes. An electric bike uses an electric motor for the purpose of moving. On these bikes, people do not have to use their muscular force to move. It uses electrical energy for motion. There are many varieties of electric bicycles. Some of these bikes have a rechargeable battery. This makes it easy to power the bike whenever you want. They make use of stored electrical energy in some or the other form. Dur to this form of energy, the bike has more power and speed. These bikes are more convenient than regular ones. Nowadays there is growing demand for electric bikes in India as there will be less air pollution, lower maintenance cost and reduce noise pollution by using e-bikes. The primary objective of the project is to study on a feasible yet highly adaptable e-bike. As the number of motor vehicles on the roads throughout the world increase at staggering rate each year, the dependence on oil-based fuel grows almost unchecked. the increased use of non-renewable fossils fuels brings with it environmental problems such as: the "greenhouse elect", health problems for city delivers and concern over the stability of fuel supply. To move away from this dependence on oil, a vast amount of money is spent on the development of electrical vehicles that may be produced. This paper presents a study of electrical bike. The aim of this study is to create awareness about e-bike among people.

(According to Mohammad Zabiulla, Prasanta K.Sahu and Bandhan Bandhu Majumdar)Electric bicycles (e-bikes) are an emerging mode of sustainable transportation well-known for their individual and environmental benefits. Past research suggests factors for e-bike adoption from new and experienced e-bike users, but little is known about prospective users' attitudes. Understanding the standpoint of non-users would reveal practical barriers impeding e-bike adoption in developing markets. We identify important drivers and barriers from a representative city-level sample of prospective e-bike users in India. The study employs exploratory factor analysis integrated with a multi-criteria decision-making model to identify latent components and prioritize their variables. The results revealed five factors: user-perceived benefit-specific motivators, travel quality-specific motivators, e-bike mobility-specific motivators, perceived social and economy-specific barriers, and e-bike infrastructure-specific barriers. Attributes such as monetary savings, reduced congestion, and last-mile connectivity were identified as the most important benefits, while fear of battery explosion and lack of cycling and charging infrastructure were perceived as the key barriers. Comparison by age shows "purchase cost" as the most influencing perceived social and economy-specific barrier among young male commuters. Comparison by income underlines the diminishing importance of "purchase cost" with increasing income among males. Regardless of age, income, and trip length, females prioritized "range anxiety" over "purchase cost." The trip length-based comparison reveals the significance of "risk of theft" for males with longer trip lengths. In general, males of all groups preferred using e-bikes for "short non-commuting trips" substituting motorized transport, while females preferred using them for "last-mile connectivity." These findings offer insights for designing effective e-bike promotion campaigns for the mass adoption of e-bikes.

(According to Patcha Bhujanga Rao) The study delves into the realm of user adoption and behavior surrounding electric bikes (ebikes). It seeks to uncover the motivating factors that lead individuals to choose e-bikes as their preferred mode of transportation. The research thoroughly examines usage patterns, including how frequently e-bikes are used and the specific purposes they serve in people's daily lives. Additionally, it evaluates the environmental impact of e-bikes compared to conventional vehicles, quantifying their emissions and energy consumption. The societal implications of e-bike adoption are also assessed, considering their effects on public health, urban planning, and traffic management. Lastly, the study conducts an in-depth analysis of user behavior, encompassing safety practices and the integration of e-bikes into daily routines. The research outcomes promise to shed light on the transformative potential of ebikes in the context of sustainable transportation, offering valuable insights for policymakers, urban planners, and individuals alike.

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METHODOLOGY

The study "A Study on the consumer awareness towards electric bikes in Kolkata." adopts descriptive research design to investigate various perceptions about electric cars . With a sample size of 100 Customers,the research utilizes a random sampling technique for data collection.
Primary data is gathered through structured questionnaires distributed among Customers, while secondary data is sourced from websites and other pertinent sources. Employing statistical tools such as ONE-WAY ANOVA, and CHI- SQUARE, the study aims to achieve several secondary objectives. These objectives include to identify the factors that influence Purchase behaviour in the context of features related to electric bikes and to examine the relationship between EV bikes and purchasing decision. Through comprehensive analysis and interpretation of the gathered data, the study endeavours to offer insights vital for enhancing Customer preferences for EV bikes.

DATA ANALYSIS AND INTERPRETATION

1. PERCENTAGE ANALYSIS OF GENDER

GENDER	FREQUENCY	PERCENTAGE
MALE	64	64%
FEMALE	36	36%
TOTAL	100	100

2. PERCENTAGE ANALYSIS OF PRIMARY REASONS OF PEOPLE INTERESTED IN BUYING ELECTRIC BIKES

PRIMARY REASON	FREQUENCY	PERCENTAGE
ENVIRONMENTAL CONCERNS	27	27%
LOW RUNNING COSTS	46	46%
TECHNOLOGICAL ADVANCEMENTS	25	25%
GOVERNMENT INCENTIVES	2	2%
TOTAL	100	100

3. AGE OF RESPONDENTS

AGE	FREQUENCY	PERCENTAGE
LESS THAN 18 years	4	4%
19 to 21 years	58	58%
22 to 24 years	30	30%
Above 25 years	8	8%
TOTAL	100	100

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4. FEATURES WHICH IS IMPORTANT FOR CUSTOMERS FOR CHOOSING ELECTRIC BIKES

FEATURES	FREQUENCY	PERCENTAGE
BATTERY LIFE	60	60%
PRICE	16	16%
BRAND REPUTATION	7	7%
CHARGING INFRASTRUCTURE	17	17%
TOTAL	100	100

5. WHICH GOVERNMENT INCENTIVES IS MOST EFFECTIVE IN PURCHASE OF ELECTRIC BIKES?

INCENTIVES	FREQUENCY	PERCENTAGE
TAX CREDITS	30	30%
REBATES	15	15%
INCENTIVES	**FREQUENCY**	**PERCENTAGE**
FREE PUBLIC CHARGING	41	41%
NONE OF THE ABOVE	14	14%
TOTAL	100	100

6. HOW LIKELY ARE CUSTOMERS TO PURCHASE AN ELETRIC BIKE

LIKELINESS	FREQUENCY	PERCENTAGE
1 out of 5	9	9%
2 out of 5	17	17%
3 out of 5	44	44%
4 out of 5	22	22%
5 out of 5	8	8%
TOTAL	100	100

CHI - SQUARE TEST

To find out the difference between gender and the primary reason of people interested in buying electric bikes.

H0: There is no significant difference between gender and the primary reason of people interested in buying electric bikes.

H1: There is a significant difference between gender and the primary reason of people interested in buying electric bikes.

Chi-Square Test

Frequencies

Primary reason people are interested in purchasing an electric car

Observed N		Expected N	Residual
environmental concerns	27	25.0	2.0
lower running costs	46	25.0	21.0
technological advancement	25	25.0	.0
government incentives	2	25.0	-23.0
Total	100		

GENDER

	Observed N	Expected N	Residual
Male	64	50.0	14.0
2	36	50.0	-14.0
Total	100		

Test Statistics

	primaryreasonpeopleareinteresedinpurchasinganelectriccar	GENDER
Chi-Square	38.960[a]	7.840[b]
df	3	1
Asymp. Sig.	.000	.005

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 25.0.

b. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 50.0.

INTERPRETATION

From the above chi-square analysis, it is found that the significance value .000 is less than the table value (0.5 Based on the provided chi-square test results, there is insufficient evidence to reject the null hypothesis.

The asymptotic significance (p-value) of 0.000 is greater than the commonly used alpha level of 0.05. This means that the observed data are not significantly different from what would be expected by chance.

ONE WAY- ANNOVA TEST

To know the preferred feature on buying electric bikes.

NULL HYPOTHESIS

H0: There is no significant difference between Age and the features which is most important for customers when choosing an electric bike.

H1: There is a significant difference between Age and the Features which is most important for customers when choosing an electric bike.

ANOVA

Which feature is most important to consumers when choosing an electric car

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.299	3	1.433	1.082	.360
Within Groups	127.091	96	1.324		
Total	131.390	99			

INTERPRETATION

F-statistics: 1.082
P- value (Sig): 0.360

The p-value of 0.360 is less than the commonly used alpha level of 0.05.
This indicates that there is not enough statistical evidence to suggest that there are significant differences between the means of the groups being
compared.

REGRESSION COEFFICIENTS

To know the impact of government incentives on purchasing decision.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.136[a]	.018	.008	1.058

a. Predictors: (Constant), How likely are consumers to purchase electric cars to others

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.057	1	2.057	1.837	.178[b]
	Residual	109.733	98	1.120		
	Total	111.790	99			

a. Dependent Variable: Which government incentive is most effective in encouraging

b. Predictors: (Constant), How likely are consumers to purchase electric cars to others

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.970	.328		6.012	.000
	Howlikelyareconsumerstopurchaseelectriccarstoother	.139	.102	.136	1.355	.178

a. Dependent Variable: Whichgovernmentincentiveismosteffectiveinencouraging

INTERPRETATION

From the above analysis, it is found that government does influence the purchase of EV bikes,

FINDINGS OF THE STUDY

The majority of respondents (58%) were aged 19-21, followed by 22-14 (30%). The majority of respondents were male (64%), with females comprising 36.%. A significant portion (57%) were UG students, followed by 36% with postgraduates' students. A significant portion find the primary reason people are interested in purchasing an electric bike being lower running cost (46%), followed by environmental concerns with (27%). Battery life was the most important feature to consumers when choosing an electric was (60%), followed by charging infrastructure (17%). A significant portion believe the biggest barrier to electric car adoption according to customers was the lack of charging stations (53.5%), followed by limited range feature with (23.2%). Knowing the percentage of respondents who are willing to pay for an electric bikes compared to a traditional petrol/diesel car, with a majority choosing upto 10% more (54.5%) followed by upto 20% more with (20.2%). A majority (68%) were more associated with Ather as a brand to associate most with electric bikes. A majority of them consider how frequently do customers expect to charge their electric bikes opting for charging is every 2-3days (50%). A significant majority of them believe that they would prefer public fast charging stations as a preference of the type of charging stations (51%) and home charging stations being the second choice with (28%).A significant **majority of them(41%) believe that free public charging stations as a choice of the government incentives to be the most effective incentives of the government in encouraging electric bikes purchase.**A significant majority of them rated on how important is the environmental impact when deciding to purchase an electric car with (43.4%) of them rating it very important, folllowed by (32.3%) of them consider it extremely important with (32.3%). According to a majority think online research and visiting dealerships as the preferred method of learning about electric cars for consumers with (31%). A majority of them (44%) rated for 3 out 5 on a scale, on how likely are consumers to purchase an electric car. Finding on what would be the expected lifespan of electric bikes

battery according to consumers was 6-8years with (42.4%), followed by (33.3%) with 3-5 years. A majority of them find lower maintenance as **the most important feature that would most likely convince a consumer to switch to an electric bike with (33.3%)**. A significant majority consumers perceive the resale value of electric bikes compared to traditional bikes as Lower with (35.4%). A significant majority consider the best fit demographic **which is most likely to purchase an electric car to be Middle- Aged adults (31-50) with (46.5%).**

SUGGESTIONS FOR THE STUDY

After analysis the data collected from various users of vehicles or having knowledge about vehicles it suggests that it align with the core elements of consumer behavior, pricing strategy, and product communication, helping to increase adoption and satisfaction in the electric bike market.

The rise of electric vehicles (EVs) has garnered significant attention globally, and India, with its growing environmental concerns and traffic congestion, is increasingly shifting towards electric bikes (e-bikes) as an alternative mode of transportation. However, consumer awareness and adoption of electric bikes remain critical barriers to their widespread acceptance. This study aims to explore the level of consumer awareness toward electric bikes in India, identifying factors influencing their purchasing decisions and the barriers hindering adoption.

- To evaluate the current awareness levels among Indian consumers regarding electric bikes, including their features, benefits, and availability.
- To assess the perceptions and attitudes of consumers toward electric bikes, focusing on environmental concerns, cost-saving benefits, and performance.
- To identify key barriers such as range anxiety, high initial costs, limited charging infrastructure, and lack of knowledge that prevent consumers from adopting e-bikes.
- To analyze the role of government policies, subsidies, and incentives in raising consumer awareness and promoting electric bike adoption.
- To explore the potential market segments that are more likely to embrace e- bikes, based on factors such as age, income, and location.

This study is expected to provide valuable insights into the gaps in consumer awareness and the factors influencing e-bike adoption. The findings can help companies develop targeted marketing strategies, improve product offerings, and advocate for policies to promote the growth of the electric bike industry in India.

CONCLUSION

The electric bike market in India has experienced notable growth and is poised for further expansion, driven by a combination of factors such as rising environmental awareness, increasing urban congestion, and government incentives promoting eco- friendly transportation solutions. As India continues to grapple with air pollution, fuel costs, and traffic issues, electric bikes offer a viable and sustainable alternative for urban mobility, positioning them as an attractive solution for the country's transportation challenges.

The findings of this study suggest that the Indian market for electric bikes is largely driven by two key factors: **environmental concerns** and **cost-effectiveness**. Indian consumers are becoming more conscious of the environmental impact of traditional modes of transportation and are increasingly seeking alternatives that reduce carbon footprints. Additionally, with rising fuel prices and the financial strain of owning a car, electric bikes present a cost-efficient and practical solution for the middle-income group, particularly in urban areas. The combination of low operational costs and the convenience of avoiding traffic congestion makes electric bikes an appealing option for city dwellers.

Furthermore, **Government policies** play a crucial role in shaping the electric bike market in India. The government has introduced a range of incentives and subsidies under programs like the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme, which has contributed to the affordability and accessibility of electric bikes. These efforts not only help reduce the upfront cost of purchasing e- bikes but also encourage consumers to make the transition to greener modes of transport.

However, several challenges persist. One of the most significant barriers is the *lack of infrastructure, such as insufficient charging stations and battery swapping facilities, which can deter potential customers from adopting electric bikes.
Additionally, the **perception of limited battery range* and concerns about the durability and maintenance of electric bikes remain obstacles to mass adoption. These concerns can be mitigated through advancements in battery technology, increased investment in charging infrastructure, and focused consumer education.

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