

## **ELECTRONIC VEHICLES IN PROMOTING ENVIRONMENTAL SUSTAINABILITY: A STUDY WITH SPECIAL REFERENCE TO MYSORE CITY**

**Divya B.S**

Associate Professor

Dept. of Economics, PG Department of Economics, Maharani's Arts College for Women,  
Mysore

---

### **ABSTRACT**

The automobile sector is a main contributor to environmental pollution and greenhouse gas emissions due to the increasing dependence on fossil fuel-powered vehicles. Electric vehicles (EVs) have emerged as a sustainable solution that helps reduce emissions, improve air quality and promote energy-efficient transportation. The present research examines the role of electric vehicles in promoting environmental sustainability with special reference to Mysore City. The research is based on both primary and secondary data. Primary data were collected from 120 respondents through a structured questionnaire and secondary data were obtained from research journals, books, government reports and official websites. The collected data and the perception of customers were interpreted by using simple percentage analysis and diagrams.

The findings reveal that environmental awareness, rising fuel prices, and government incentives positively influence the adoption of electric vehicles by respondents. However, high initial purchase costs, inadequate charging infrastructure and battery-related concerns continue to show significant challenges to their widespread adoption. The study suggests that expanding charging infrastructure, strengthening government policies and incentives and creating greater public awareness are essential to accelerate the adoption of electric vehicles and support environmental sustainability. The findings provide valuable insights for policymakers, researchers, industry practitioners and other stakeholders in developing effective strategies to promote sustainable urban mobility.

**Keywords:** Automobile Sector, Electric Vehicles, Environmental Sustainability, Sustainable Solution, Consumer Perception, Mysore City.

### **1.1 INTRODUCTION**

The transportation sector is crucial to developing the economy through helping to promote mobility, international trade, industrial development and social interaction. However, environmental issues have been greatly increased throughout the world by rapid urbanization, growing populations and increasing dependency on private vehicles. Conventional internal combustion engine (ICE) powered vehicles use a significant amount of petroleum-based fuels and produce significant amounts of carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), particulate matter (PM) and other harmful pollutants that contribute to global warming, declining air quality and negative public health outcomes. So, the transformation towards sustainable transportation systems is a global priority.

Nowadays, Electric vehicles (EVs) are recognized as one of the most important innovations in technology that may solve these environmental issues. As compared to conventional type of vehicles these electric vehicles significantly decreases air pollution and dependence on petroleum-based fuels. They are adopted by different countries in support of the global commitment towards achieving the Sustainable Development Goals (SDGs) particularly SDG

7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action).

Governments around the world announced a variety of tax incentives, technological assistance mechanisms and regulatory frameworks in order to encourage electric vehicles. The United States, Norway, China, Germany and the Netherlands have made considerable achievements in the adoption of electric vehicles through comprehensive regulatory reforms, charging infrastructure expansion and commitment to battery technology standardisation. These different experiences suggest the importance of supportive public policy, technological advancement and consumer awareness for the successful shift to electric vehicles.

In this background, the present study examines the importance of electric vehicles in promoting environmental sustainability with special reference to Mysore City. It analyzes the environmental impact of EVs, investigates the factors that influence consumer willingness to adopt them, takes into account the obstacles to adoption, and suggests policy implications to enhance environmentally friendly urban transportation systems.

## 1.2 OBJECTIVES

The primary objectives of this study are:

- To analyse the factors influencing the adoption of electric vehicles among consumers in Mysore City.
- To identify the major challenges associated with the adoption of electric vehicles in Mysore City.

## 1.3 METHODOLOGY OF THE STUDY

This research paper was conducted with both descriptive and analytical approach to find out the role of electric vehicles in promoting the environmental sustainability of Mysore City. Primary and secondary data have been used to the analysis. The primary data were collected from 120 respondents by convenience sampling method by using a structured questionnaire and the secondary data was collected from research publications, books, government reports, policy documents and official websites. The collected data was examined using simple percentage analysis. The results were presented using tables and diagrams. The study limited itself to the area of Mysore City and was aimed at investigating the perception of respondents on the adoption and challenges of electric vehicles.

**TABLE NO. 1.3.1. DEMOGRAPHIC PROFILE OF RESPONDENTS**

| DEMOGRAPHIC VARIABLES | CATEGORY        | FREQUENCY | PERCENTAGE |
|-----------------------|-----------------|-----------|------------|
| GENDER                | Male            | 66        | 55         |
|                       | Female          | 54        | 45         |
| AGE                   | 18-28           | 32        | 26.67      |
|                       | 29-39           | 26        | 21.67      |
|                       | 40-50           | 38        | 31.67      |
|                       | 51-61           | 14        | 11.67      |
|                       | 62 and Above    | 10        | 8.33       |
| EDUCATION             | SSLC            | 28        | 23.33      |
|                       | PUC             | 12        | 10         |
|                       | Graduation      | 42        | 35         |
|                       | Post Graduation | 38        | 31.67      |
| OCCUPATION            | Students        | 26        | 21.67      |
|                       | Government      | 38        | 31.67      |

|                       |                          |     |       |
|-----------------------|--------------------------|-----|-------|
| <b>MONTHLY INCOME</b> | <b>Employees</b>         |     |       |
|                       | <b>Private Employees</b> | 46  | 38.33 |
|                       | <b>Others</b>            | 10  | 8.33  |
|                       | <b>Below ₹25,000</b>     | 18  | 15    |
|                       | <b>₹26,000–₹75,000</b>   | 36  | 30    |
|                       | <b>₹76,000–₹125,000</b>  | 42  | 35    |
|                       | <b>Above ₹126,000</b>    | 24  | 20    |
|                       | <b>Total</b>             | 120 | 100   |

The above demographic profile of the respondents shows that the present study has included a different group of participants from different socio-economic backgrounds. Among the 120 respondents, 55 percent were male and 45 percent were female. With regard to age of the respondents, the largest proportion of respondents i.e, 31.67 per cent belonged to the 40–50 years age group, 26.67 percent in the 18–28 years category and 21.67 percent in the 29–39 years category. Respondents who aged 51–61 years and 62 years and above were 11.67 percent and 8.33 percent respectively. With respect to educational qualification, 35 percent of the respondents were graduates, followed by 31.67 percent postgraduates, 23.33 percent with SSLC qualification and 10 percent with PUC qualification, showing that the majority of respondents possessed higher educational qualifications.

With reference to occupation the table shows that 38.33 percent of the respondents were employed in the private sector, 31.67 percent were government employees, 21.67 percent were students and the remaining 8.33 percent belonged to other occupations. Regarding monthly income, the highest proportion of respondents i.e, 35 percent earned between ₹76,000 and ₹125,000 followed by 30 percent earning ₹26,000–₹75,000. About 20 percent reported a monthly income above ₹126,000, while 15 percent earned below ₹25,000. In total, the demographic profile indicates that the study represents respondents with different educational, occupational and income backgrounds.

#### 1.4. GROWTH AND TRENDS OF ELECTRIC VEHICLES IN INDIA

India's electric vehicle (EV) market is showing a stable growth in India, government's favourable regulations and policies, rising environmental awareness and consciousness and rapid technology advancements have positive impact. The transition from traditional transportation to electric mobility aims to promote sustainable transportation, reduce the dependency on petrol fuels, increase energy efficiency and tackle environmental issues such as air quality and greenhouse gas emissions. Innovations in battery technology, car performance and charging infrastructural development and consumer preference for more sustainable and less expensive transportation options have helped the adoption of electric vehicles around the country. In addition to this, important regulatory measures, investments in research and development have contributed significantly to establish a supportive atmosphere for the development and expansion of the EV market. Therefore the emergence of electric vehicles is a major revolution in India's automobile sector helping towards sustainable mobility and has the aim of the accomplishment of the country's long-term sustainable development goals.

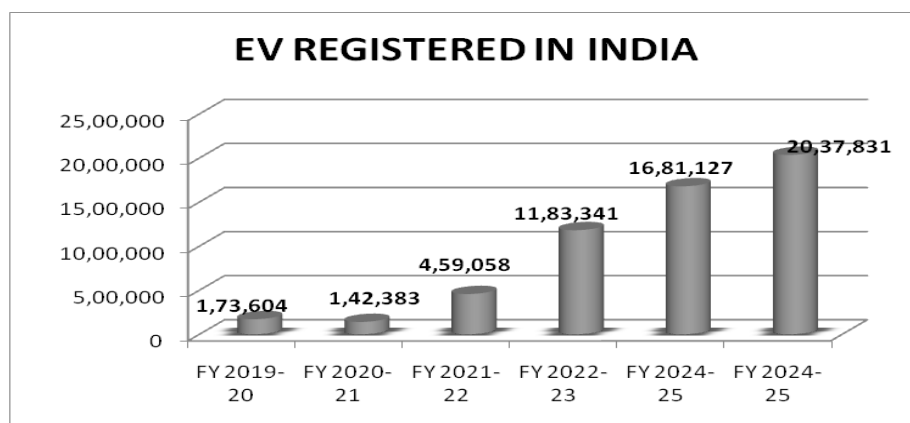
**TABLE NO – 1.4.1. NUMBER OF REGISTERED ELECTRIC VEHICLES IN INDIA**

| SL. NO. | YEAR       | NUMBER OF REGISTERED EVs IN INDIA |
|---------|------------|-----------------------------------|
| 1       | FY 2019-20 | 1,73,604                          |
| 2       | FY 2020-21 | 1,42,383                          |
| 3       | FY 2021-22 | 4,59,058                          |
| 4       | FY 2022-23 | 11,83,341                         |

|   |            |           |
|---|------------|-----------|
| 5 | FY 2024-25 | 16,81,127 |
| 6 | FY 2024-25 | 2,037,831 |

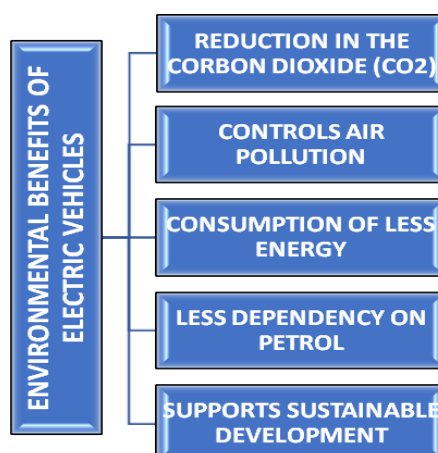
Source : (e-Vahan Portal :Ministry of Road Transport & Highways)

#### DIAGRAM NO – 1.4.1. NUMBER OF REGISTERED ELECTRIC VEHICLES IN INDIA



**Figure no – 1.4.1. Environmental benefits of electric vehicles**

As per the information of the e-Vahan Portal of the Ministry of Road Transport and Highways (MoRTH), Government of India, the number of registered electric vehicles (EVs) in India has increased considerably over the past 6 years, indicating the country's rapid change towards green mobility. EV registrations increased from 1,73,604 in FY 2019–20 to 4,59,058 in FY 2021–22, despite a temporary decline to 1,42,383 in FY 2020–21, it was mainly due to the sudden occurrence of the COVID-19 pandemic. A significant rise was recorded in FY 2022–23, with registrations reaching 11,83,341, showing a growing consumer acceptance and the positive impact of government initiatives promoting electric transportation. The upward trend continued in the following years, with registrations increasing to 16,81,127 and further to 20,37,831, illustrating the expanding adoption of electric vehicles across the country. This consistent and drastic growth can be due to good government policies, technological innovations, increasing environmental awareness and the India's commitment to promoting green energy.



The above figure explains the important environmental benefits of electric vehicles (EVs). The figure highlights that EVs contribute in reducing greenhouse gas emissions namely

Carbon dioxide (CO<sub>2</sub>), Carbon monoxide (CO), Nitrogen oxides (NO<sub>x</sub>), Hydrocarbons (HC) and so on and helps to minimise climate change and improve environmental quality. They also help reduce air pollution by producing little or no harmful gases and pollutants. In addition to this, EVs use less energy than conventional vehicles and reduce the dependence on Conventional fuels such as petrol and diesel. Another main advantage is the electric vehicles play a significant role in facilitating environmental sustainability through improved environmental quality.

### 1.5. DATA ANALYSIS AND INTERPRETATION

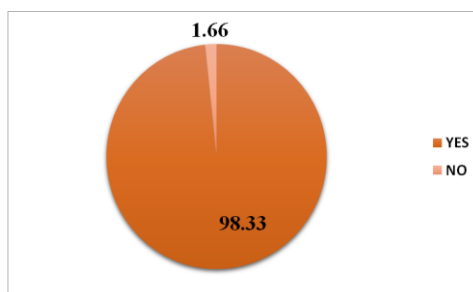
This part of the paper analyses and interpret the primary data collected from 120 respondents in Mysore City through a structured questionnaire. It examines the socio-economic profile of the respondents, their awareness of electric vehicles and the factors influencing their purchasing willingness to adopt green transportation. The study also analyses respondents' perceptions regarding the benefits and challenges of electric vehicles. The collected data were analysed using simple tools such as tables and diagrams.

**TABLE NO – 1.5.1. AWARENESS ABOUT ELECTRIC VEHICLES AMONG RESPONDENTS**

| AWARENESS ABOUT EVs | NUMBER OF RESPONDENTS | PERCENTAGE |
|---------------------|-----------------------|------------|
| YES                 | 118                   | 98.33      |
| NO                  | 02                    | 1.66       |
| TOTAL               | 120                   | 100        |

Source: Primary Data

**DIAGRAM NO - 1.5.1. AWARENESS ABOUT ELECTRIC VEHICLES AMONG RESPONDENTS**



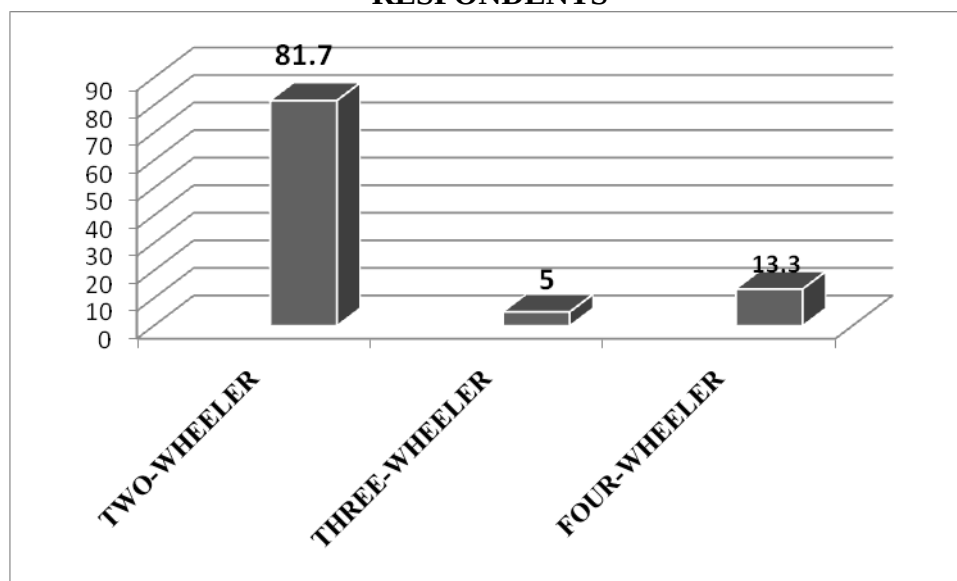
The above table and diagram clearly show the awareness on Electric Vehicles (EVs) among the respondents in the study area. Out of 120 respondents, 118 respondents (98.33%) know about EVs, while only 2 respondents (1.66%) are not aware of EVs. This reflects that the majority of the respondents have knowledge and awareness about Electric Vehicles.

**TABLE NO – 1.5.2. TYPES OF ELECTRIC VEHICLES OWNED BY RESPONDENTS**

| TYPES OF EV   | NUMBER OF REESPONDENTS | PERCENTAGE |
|---------------|------------------------|------------|
| TWO-WHEELER   | 98                     | 81.7       |
| THREE-WHEELER | 06                     | 5          |
| FOUR-WHEELER  | 16                     | 13.3       |
| TOTAL         | 120                    | 100        |

Source: Primary Data

**DIAGRAM NO - 1.5.2. TYPES OF ELECTRIC VEHICLES OWNED BY RESPONDENTS**



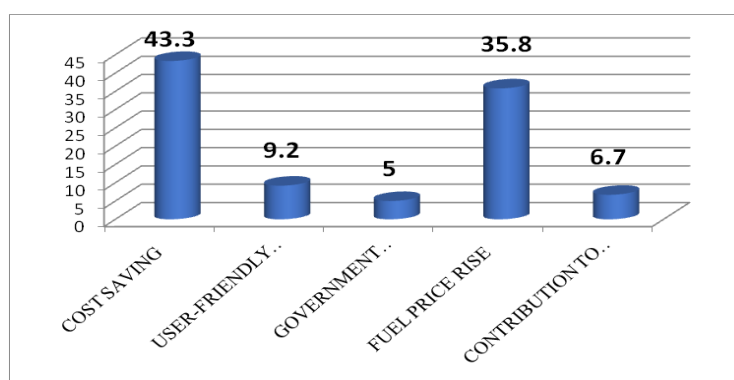
The above table 4.2 shows the types of electric vehicles used by the respondents. Out of 120 respondents, 81.7 per cent use electric two-wheelers, 13.3 per cent use electric four-wheelers, and only 5 per cent use electric three-wheelers. The results show that electric two-wheelers are the most commonly used type of electric vehicle among the respondents.

**TABLE NO – 1.5.3. MAIN REASONS FOR CHOOSING ELECTRIC VEHICLES**

| REASONS                          | NUMBER OF RESPONDENTS | PERCENTAGE |
|----------------------------------|-----------------------|------------|
| COST SAVING                      | 52                    | 43.3       |
| USER-FRIENDLY DRIVING EXPERIENCE | 11                    | 9.2        |
| GOVERNMENT INCENTIVES            | 6                     | 5          |
| FUEL PRICE RISE                  | 43                    | 35.8       |
| CONTRIBUTION TO ENVIRONMENT      | 8                     | 6.7        |
| TOTAL                            | 120                   | 100        |

Source: Primary Data

**DIAGRAM NO -1.5.3. MAIN REASONS FOR CHOOSING ELECTRIC VEHICLES**



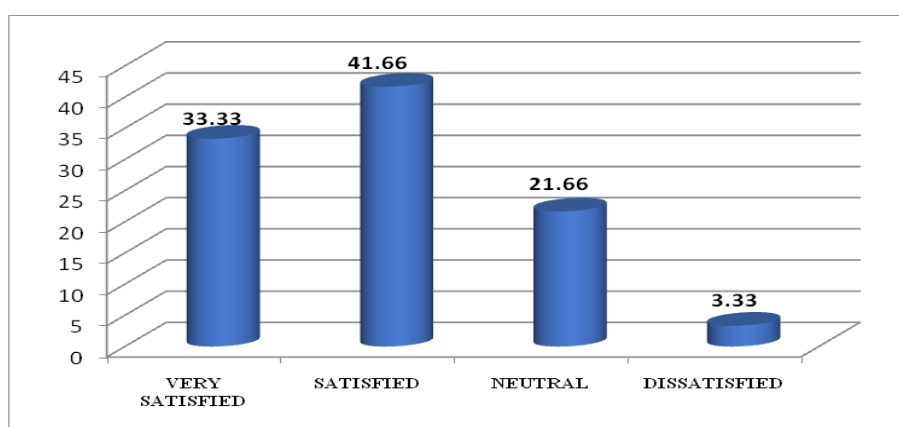
The above data show the main reasons for choosing electric vehicles among respondents. Among the 120 respondents, 43.3 per cent chose electric vehicles because it helps them to save money. Another 35.8 per cent selected electric vehicles due to the increase in petrol and diesel prices. About 9.2 per cent preferred electric vehicles because they are easy and comfortable to drive. Only 6.7 per cent chose them to protect the environment, while 5 per cent were influenced by government incentives. Overall, the results show that saving money and rising fuel prices are the main reasons for choosing electric vehicles among the respondents.

**TABLE NO- 1.5.4. SATISFACION LEVEL OF RESPONDENTS WITH ELECTRIC VEHICLES**

| SATISFACTION LEVEL | NUMBER OF RESPONDENTS | PERCENTAGE |
|--------------------|-----------------------|------------|
| VERY SATISFIED     | 40                    | 33.33      |
| SATISFIED          | 50                    | 41.66      |
| NEUTRAL            | 26                    | 21.66      |
| DISSATISFIED       | 04                    | 3.33       |
| TOTAL              | 120                   | 100        |

Source: Primary Data

**DIAGRAM NO - 1.5.4. SATISFACION LEVEL OF RESPONDENTS WITH ELECTRIC VEHICLES**



The above table and diagram show the satisfaction level of respondents with electric vehicles. The results reveal that 41.66 per cent of the respondents are satisfied with electric vehicles, while 33.33 per cent are very satisfied. About 21.66 per cent of the respondents have a neutral opinion, and only 3.33 per cent are dissatisfied. Overall, the findings indicate that most respondents are satisfied with electric vehicles, suggesting a positive level of acceptance and user experience among EV users in the study area.

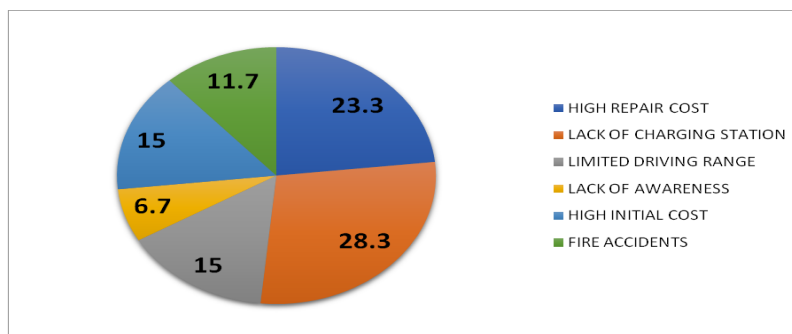
**TABLE NO –1. 5.5. MAIN CHALLENGES TO THE ADOPTION OF ELECTRIC VEHICLES**

| BARRIERS                 | NUMBER OF RESPONDENTS | PERCENTAGE |
|--------------------------|-----------------------|------------|
| HIGH REPAIR COST         | 28                    | 23.3       |
| LACK OF CHARGING STATION | 34                    | 28.3       |
| LIMITED DRIVING RANGE    | 18                    | 15         |

|                   |     |      |
|-------------------|-----|------|
| LACK OF AWARENESS | 08  | 6.7  |
| HIGH INITIAL COST | 18  | 15   |
| FIRE ACCIDENTS    | 14  | 11.7 |
| TOTAL             | 120 | 100  |

Source: Primary Data

#### DIAGRAM NO –1. 5.5. MAIN CHALLENGES TO THE ADOPTION OF ELECTRIC VEHICLES



The above table and diagram show the main barriers/ challenges to the adoption of electric vehicles among the respondents. The results show that 28.3 per cent of the respondents consider the lack of charging stations as the biggest barrier to adopting electric vehicles. This is followed by high repair cost, it is reported by 23.3 per cent of the respondents. About 15 per cent each identified limited driving range and high initial cost as major challenges. In addition, 11.7 per cent of the respondents expressed concern about fire accidents, while charging them at house, only 6.7 per cent stated that lack of awareness is a barrier. Overall, the findings show that inadequate charging infrastructure, high repair costs, and the high purchase cost of electric vehicles are the major obstacles to their wider adoption.

#### 1.6. FINDINGS AND SUGGESTIONS

This section presents the main findings of the study based on the data information collected from the respondents. The findings show the awareness and opinions and perception of the respondents towards electric vehicles and their contribution to environmental sustainability. It also highlights the main reasons for adopting electric vehicles and the major problems faced by users in Mysore City.

- ✓ The demographic profile of the respondents shows that the study included people from different socio-economic backgrounds. Out of 120 respondents, **55 per cent were male** and **45 per cent were female**. The highest number of respondents (**31.67 per cent**) belonged to the **40–50 years** age group, followed by **26.67 per cent** in the **18–28 years** age group. In terms of education, **35 per cent** of the respondents were graduates and **31.67 per cent** were postgraduates, showing that most of the respondents had a good educational background.
- ✓ With regard to occupation, **38.33 per cent** of the respondents were private employees, while **31.67 per cent** were government employees. Regarding monthly income, **35 per cent** of the respondents earned between **₹76,000 and ₹125,000**, followed by **30 per cent** who earned between **₹26,000 and ₹75,000**. Overall, the respondents belonged to different age groups, educational levels, occupations, and income groups, which helped provide a better understanding of electric vehicle adoption in the study area.

- ✓ The findings reveal that **98.33 per cent** of the respondents are aware of electric vehicles, while only **1.66 per cent** are not aware. This indicates a high level of awareness about electric vehicles among the respondents.
- ✓ It shows that **81.7 per cent** of the respondents own electric two-wheelers, **13.3 per cent** own electric four-wheelers, and **5 per cent** own electric three-wheelers. This indicates that electric two-wheelers are the most commonly used electric vehicles among the respondents.
- ✓ It is revealed that **cost saving (43.3 per cent)** is the main reason for choosing electric vehicles, followed by **rising fuel prices (35.8 per cent)**. A smaller number of respondents chose electric vehicles because of their **user-friendly driving experience (9.2 per cent)**, **contribution to the environment (6.7 per cent)**, and **government incentives (5 per cent)**.
- ✓ The findings indicate that the majority of respondents are satisfied with electric vehicles. About **41.66 per cent** are satisfied, **33.33 per cent** are very satisfied, **21.66 per cent** have a neutral opinion, and only **3.33 per cent** are dissatisfied. This shows that respondents have a positive opinion about electric vehicles.
- ✓ The findings show that the **lack of charging stations (28.3 per cent)** is the biggest challenge to adopting electric vehicles, followed by **high repair costs (23.3 per cent)**. Other challenges include **limited driving range (15 per cent)**, **high initial cost (15 per cent)**, **fire accidents (11.7 per cent)**, and **lack of awareness (6.7 per cent)**. This indicates that infrastructure and cost-related issues are the major barriers to the adoption of electric vehicles.

## SUGGESTIONS

- ✓ Increase the number of charging stations all around India to make it easier for electric vehicle owners to charge their vehicles.
- ✓ Offer further government subsidies and financial incentives to reduce the cost to purchase electric vehicles and promote the acquisition of electric vehicles by more individuals.
- ✓ Create awareness of the advantages of electric vehicles among people through schools, colleges, social media and public campaigns.
- ✓ Enhance battery technology and safety regulations to improve driving range, lower repair costs and alleviate worries over battery safety and fire incidents.
- ✓ Promote the use of renewable energy sources such as solar energy to charge electric vehicles and help to make transportation more environment-friendly.
- ✓ Encourage cooperation among the government, car makers and private sector to enhance the charging infrastructure, create superior technology and promote the use of electric vehicles.

## CONCLUSION

In conclusion, it is said that electric vehicles have great scope to support environmental sustainability in Mysore City. The findings show that people have a positive opinion about electric vehicles, mainly they help save money and reduce environmental pollution. However,

the wider use of electric vehicles depends on better charging facilities, lower purchase costs, improved technology and greater public awareness.

Electric vehicles are comfortable and more sustainable alternative to petrol and diesel vehicles. They can help reduce air pollution and support a healthier environment. To enhance the adoption of electric vehicles, it is important to strengthen government support, improve charging infrastructure and create more awareness among the public. With the combined efforts of the government, manufacturers and citizens, electric vehicles can play an crucial role in building a cleaner and more sustainable future for Mysore City.

## REFERENCES

1. Kambli, R. O. (2022). Electric vehicles in India: Future and challenges. *International Journal for Research in Applied Science and Engineering Technology*, 10(2), 398–402.
2. Lingegowda, B. M. H. P., & Kumar, A. N. S. (2022). A conceptual study of electric vehicle market in India. *International Journal of Engineering and Management Research*, 12(4), 193–198.
3. Prasad, J. V. (2022). People thinking general facts about electric vehicles in India 2022. *International Journal for Research in Applied Science and Engineering Technology*, 10(5), 3937–3946.
4. Shakya, R. (2021). A study on development of electric vehicles in India. *International Journal for Research in Applied Science and Engineering Technology*, 9(6), 1175–1177.
5. Shreya, A. S., Hole, D., & Matia, A. (2022). Why is electric vehicle not booming in India? *International Journal for Research in Applied Science and Engineering Technology*, 10(12), 2386–2389.
6. Sun, F. (2006). Current situation and trend of development of electric vehicle. *Science Chinese People*, 8, 44–47.

## WEBSITES

- <https://afdc.energy.gov/fuels/electricity-benefits>
- <https://mnre.gov.in/en/>
- <https://vahan.parivahan.gov.in/vahanservice/vahan/ui/statevalidation/homepage.xhtml>