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A STUDY OF IMPACT OF ELECTRIC VEHICLE ON AGRICULTURE ECONOMY OF INDIA

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ABSTRACT

Electric vehicles (EVs) can have both positive and negative impacts on the agricultural economy. On the positive side, the use of EVs in agriculture can help reduce the carbon footprint of the sector. Many farmers rely on diesel-powered machinery, which emits greenhouse gases and contributes to air pollution. By replacing these machines with electric counterparts, farmers can reduce their environmental impact. In addition, the use of EVs in agriculture can lower operating costs for farmers. Electric tractors and other machinery may be more expensive to purchase upfront, but they have lower ongoing costs of operation than diesel-powered machines, due to lower fuel and maintenance costs. On the negative side, the shift to electric vehicles could have a negative impact on the oil and gas industry, which has long been a major source of income for many agricultural communities. Some communities may face job losses and other economic challenges as a result of decreased demand for fossil fuels. There may also be challenges related to the infrastructure required to support widespread use of EVs in rural areas. Electric charging stations may not be as readily available in rural areas as they are in urban areas, which could limit the usefulness of electric farming machinery.

Keywords: *Electric Vehicles, Agriculture Economy, Infrastructure, Farmers, Economic Challenges.*

Introduction

Impact of electric vehicles on the agricultural economy will depend on a variety of factors, including the specific region and industry in question, as well as the availability of infrastructure and government support for the transition to electric farming machinery. The impact of electric vehicles (EVs) on the agriculture economy can be both positive and negative. Here are a few potential ways that EVs could impact the agriculture industry:

- **Increased Demand for Certain Crops:** As more people switches to electric vehicles, there may be an increased demand for crops used in the production of biofuels, such as corn, soybeans, and sugarcane. This could lead to increased prices for these crops and benefit farmers who grow them.
- **Reduced Demand for other Crops:** On the other hand, as more people switch to electric vehicles, there may be reduced demand for crops used in the production of gasoline, such as oilseeds like soybeans and canola. This could lead to lower prices for these crops and hurt farmers who grow them.
- **Reduced Transportation Costs:** The adoption of electric vehicles could also lead to reduced transportation costs for farmers. EVs have lower fuel and maintenance costs compared to gasoline-powered vehicles, which could reduce the cost of transporting crops from farm to market.
- **Increased Demand for Charging Infrastructure:** As the number of EVs on the road increases, there will be a greater need for charging infrastructure. This could lead to increased demand for electricians and other tradespeople who install and maintain charging stations.
- **Impact on Rural Electricity Grids:** If a large number of EVs are charging in rural areas, it could put a strain on local electricity grids. This could lead to increased costs for electricity, which could hurt farmers who rely on electricity for their operations.

Objectives of the Study

Overall, the impact of electric vehicles on the agriculture economy will depend on a variety of factors, including the type of crops grown and the location of farms. However, it's likely that there will be both positive and negative impacts on the industry as a whole.

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On the positive side, EVs can reduce the carbon footprint of agriculture, which is a significant contributor to greenhouse gas emissions. By using electric tractors and other farm equipment, farmers can reduce their reliance on fossil fuels and reduce their carbon emissions. Additionally, EVs can reduce noise pollution, which can benefit farm animals and nearby communities.

On the negative side, the widespread adoption of EVs could have an impact on the demand for biofuels, which are currently used in many agricultural processes. Biofuels are made from crops like corn and soybeans, and their production supports many farmers. If the demand for biofuels decreases, it could have a negative impact on the agricultural economy.

Additionally, the infrastructure required to support EVs, such as charging stations and the power grid, could have an impact on the availability and cost of electricity, which could affect the cost of operating farms and processing facilities. Overall, the impact of EVs on the agriculture economy is likely to be complex and varied, and will depend on a range of factors such as government policies, infrastructure development, and technological advancements. However, it is clear that the adoption of EVs could have both positive and negative impacts on the agriculture sector.

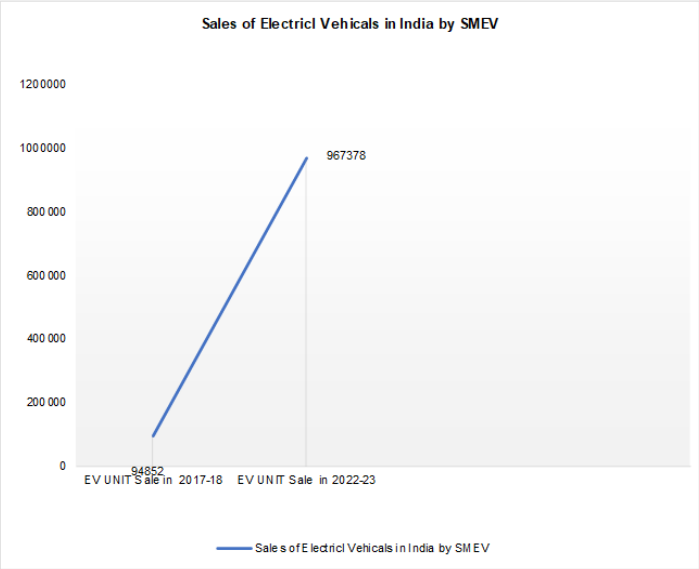
The adoption of EVs could have different impacts on rural communities depending on their proximity to urban areas and access to charging infrastructure. Rural communities that are further away from urban centres may face challenges in accessing charging stations, which could limit their ability to adopt EVs. It's worth noting that the electric vehicle market in India is still in its early stages of development, and there are several challenges to its growth, including high costs, lack of charging infrastructure, and limited consumer awareness. However, the government and several private players are taking steps to address these challenges and promote the adoption of EVs in the country.

the Society of Manufacturers of Electric Vehicles (SMEV), which represents electric vehicle manufacturers in India, reported the following statistical data for electric vehicles (EVs) in India:

Category	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Grand Total
E-2 Wheelers	1981	27478	26512	44394	249615	602553	952533
E-3 Wheelers	90411	114136	140754	88497	178169	327020	938987
E-4 Wheelers	2433	2460	2740	5952	20172	36066	69823
E-Buses	27	53	363	217	1066	1739	3465
Grand Total	94852	144127	170369	139060	449022	967378	1964808

Source: Society of Manufacture of EVs

Total EV sales: According to SMEV, the sales of electric vehicles in India increased by 101%% in the fiscal year 2017-18 to 2022-23, with 967378 units sold compared to 94,852 units sold in the 2017-18 year.



Source: Society of Manufacture of EVs

- **EV Market Share:** The market share of EVs in India was around 1.5% in FY 2020-21.
- **EV Segments:** The majority of EVs sold in India in FY 2020-21 were two-wheelers (88%), followed by three-wheelers (8%), and four-wheelers (4%).
- **Top EV Models:** According to SMEV, the top-selling electric models in India in FY 2020-21 were the Ather 450X (electric scooter), followed by the Bajaj Chetak (electric scooter), and the MG ZS EV (electric SUV).
- **Charging Infrastructure:** As of September 2021, India had around 1,800 public EV charging stations, according to data from the Ministry of Power. The government aims to install at least one charging station every 3 km in cities and every 25 km on highways.

It's worth noting that these statistics are constantly changing, and more recent data may be available.

Here are some statistics on electric vehicles in India:

- As of March 2021, there were over 1.75 lakh (175,000) electric vehicles (EVs) registered in India.
- Out of the total EVs registered in India, 78% are two-wheelers, 15% are three-wheelers, and the remaining 7% are four-wheelers.
- In 2020, the sale of electric two-wheelers in India saw a growth of 140% compared to the previous year.
- In the first half of 2021, India's electric vehicle sales reached nearly 36,000 units, which is more than double the number of EVs sold during the same period in 2020.
- The Indian government has set a target of achieving 30% electric vehicle penetration in the country by 2030.
- In 2019, Delhi had the highest number of electric vehicles registered among all states and union territories in India, followed by Uttar Pradesh and Maharashtra.
- According to a report by the International Energy Agency, India had the second-highest number of electric two-wheelers in the world, after China, as of 2020.

Source: Report by the International Energy Agency, India

Conclusions

The impact of electric vehicles (EVs) on the agricultural economy can be both positive and negative. Here are some ways in which EVs could affect the agriculture sector:

- **Reduced Emissions:** Electric vehicles are known to produce fewer emissions than traditional gasoline-powered vehicles. This could be a significant benefit for the agricultural sector, as it could help reduce air pollution that affects crop yields.
- **Lower Operating Costs:** EVs have lower operating costs than traditional vehicles, since they require less maintenance and use electricity as fuel, which is typically cheaper than gasoline or diesel. This could benefit farmers who use EVs for transportation, as they would save money on fuel and maintenance.
- **Increased Demand for Raw Materials:** EVs require large amounts of raw materials such as lithium, cobalt, and nickel for their batteries. This could lead to increased demand for these materials, which could benefit mining and extraction industries that produce them.
- **Changes in Energy Demand:** If the use of EVs becomes widespread, it could lead to changes in energy demand patterns. For example, if many EV owners start charging their vehicles at night, it could lead to increased demand for electricity during off-peak hours. This could have implications for energy infrastructure and pricing.
- **Impact on Rural Communities:** The adoption of EVs could have different impacts on rural communities depending on their proximity to urban areas and access to charging infrastructure. Rural communities that are further away from urban centres may face challenges in accessing charging stations, which could limit their ability to adopt EVs.

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