# Application Of E-Cycles (Electric Cycles) In Ride-Sharing Services Like Uber and Ola: A Sustainable Solution to Fuel Scarcity, Economic Crisis, And Climate Change in The Special Context of Northeast India

H B Dibyakshi Choudhury
*The Lead Researcher of Mathematics, Economics and Traditional Science, Student of Class Nine, Dakshin Guwahati Jatiya Vidyalaya*

***Abstract*—At present, global warming and the continuous price hike of fossil fuels (petrol and diesel) have posed a significant threat to the economy and ecosystem worldwide. This has had a direct impact on urban transportation system (such as Uber, Ola etc), resulting in an abnormal increase in the daily community expenses of passengers. This research paper highlights the practical application of E-cycles (electronic cycle) as an efficient and technology alternative to conventional fuel -driven vehicles, focusing closely on the geographical and traffic context of fast-growing cities in northeast India, particularly Guwahati, Assam. This study provides a true scientific and economic analysis of the practical aspects, operation and efficiency, conservation of fossil fuels, temperature control in urban areas of the northeast, reduction of the fare burden on consumers, local economic stability, and its far-reaching positive impacts on overall public health.**

## I. INTRODUCTION

Rapid urbanization and industrialization in the 21st century have led to an unprecedented transformation in the urban transport sector. Although app-based ride-sharing platforms like Uber, Ola, or Rapido have made commuting easier for people, the underlying consumption of fuel has created a crisis. Due to the gradual depletion of non-renewable resources like petrol and diesel, their prices are increasing day by day. This price hike not only deals a severe blow to the economy of the general public, but the carbon emitted from these vehicles is also completely destroying the atmospheric balance.

In growing metropolitan cities like Guwahati, which is the gateway to Northeast India, this problem is even more complex, as its geographical structure and rising traffic congestion have severely disrupted the transport system. For short-distance (0 to 8 kilometres) urban commuting, the use of four-wheelers or heavy two-wheelers has proven to be highly wasteful. In this context, the electric cycle (E-Cycle) has emerged as an appropriate, eco-friendly, and economically viable engineering alternative.

## II. PRACTICAL ASPECTS AND OPERATIONAL FEASIBILITY

The integration of E-cycles in the ride-sharing sector is not merely an imaginary concept, but rather it is technically and practically completely feasible. Its practical aspects can be analyzed as follows:

### 2.1. Technological Efficiency

- Battery and Motor Technology: Modern E-cycles utilize high-performance Lithium-ion batteries and BLDC motors. Once fully charged, it can cover a distance of 50 to 80 kilometres, making it perfectly suitable for daily short-distance commuting within our local cities.
- Pedal-Assist System: The smart sensor technology in e-cycles measures the rider's pedalling input and controls the motor power accordingly. As a result, the rider can reach the destination in less time without becoming excessively fatigued.

### 2.2. Traffic Navigation and Time Savings

- Sleek Design: The biggest problem in the cities of the Northeast, especially Guwahati, is traffic

congestion (Traffic Jams). In places where big cars or auto-rickshaws remain stranded for hours, the E-cycle, due to its small framework, can easily navigate through traffic and narrow streets in a short time.

- Time Management: As a result, passenger travel time is reduced by approximately 30%, which enhances the overall daily efficiency and productivity of the city.

2.3. App Integration

- Digital Tracking: Similar to current Uber or Ola apps, GPS and IoT (Internet of Things) devices can be integrated into E-cycles. Customers will be able to book nearby E-cycles through their mobile phones, and after completing the journey, they can lock them by scanning a digital QR Code.

## III. CORE OBSERVATIONS AND IMPACTS

3.1. Conservation of Fossil Fuels and Long-Term Security

Petrol and diesel are the results of biological transformations occurring in the lap of nature over millions of years. Their formation process is extremely slow, but the rate of consumption is highly intense.

- Protection of Natural Resources: The widespread use of E-cycles will significantly reduce the dependence on crude oil.
- Future Security: Reducing fuel consumption in daily commuting will ensure these limited resources are conserved for many years to come, providing future generations with a stable and sustainable source of energy.

3.2. Protection of Natural Balance and Global Warming Control

Conventional fuel-driven vehicles are the primary source of carbon emissions, which create the 'Greenhouse Effect' and increase global temperatures.

- Reduction of Carbon Footprint: Since E-cycles require no fuel, they are a completely zero-emission technology.
- Local Temperature Control: In tropical regions like Assam, the primary reason for the abnormal rise in temperature in cities nowadays is the heat emitted from vehicle engines (Urban Heat Island). The use of E-cycles will reduce the local temperature of the city and help restore the balance of the natural seasonal cycle.

3.3. Commuting Cost and Affordable Fare Equation

At present, the primary reason for the exorbitant fares of Uber or Ola is the high cost of petrol-diesel and the heavy maintenance costs (Maintenance Cost) of vehicles.

- Reduction of Operational Cost: Research shows that compared to the cost per kilometer required to run a petrol-driven car or motorcycle, an E-cycle costs only 10% (based on electricity bills).
- Relief for Customers: When operational costs are reduced to this extent, companies will be able to provide services to customers at very low fares. As a result, the general middle-class and lower-middle-class people of the Northeast will benefit in the long run.

Comparison of Operational Cost (Approximate per Kilometer):

| Vehicle Type | Fuel / Energy Cost | Maintenance Cost | Overall Cost |
|---|---|---|---|
| Petrol-driven Vehicle | High (₹7 - ₹10) | Medium | High |
| Electric Cycle (E-Cycle) | Extremely Minimal (₹0.10 - ₹0.20) | Low | Extremely Low |

3.4. Strengthening the Economic Foundation and Profit Margin

The E-cycle industry can bring a major positive change to the overall economy of the country.

- Increase in Profit Margin: Purchasing an E-cycle is very affordable for our local unemployed youth or drivers. Since e-cycles can be operated with low capital and minimal expenses, the profit margins of drivers or service provider companies will increase significantly.
- Protection of the National Economy: A developing country like India spends a large portion of its budget on importing crude oil from foreign nations; E-cycles running on domestically produced solar energy or electricity will save foreign exchange for the country and make the economic foundation of our region self-reliant.

### 3.5. Reduction of Global Warming and Improvement of Public Health

Climate change and air pollution are closely related to public health. Vehicle smoke is the primary cause of increasing respiratory diseases (asthma, bronchitis) and heart diseases in growing, air pollution-prone cities like Guwahati.

- Pure Atmosphere: The use of E-cycles will improve the Air Quality Index (AQI) of the city.
- Improvement in the Health Sector: Reduction in air pollution and excessive heat will strengthen public health. When people are healthy, productivity will increase, saving crores of rupees for the public and the government that would otherwise be spent on medical treatments.

### 3.6. Special Relevance to Northeast India and Assam

At present, micro-mobility startups like 'Yulu' or 'Lime' are successfully operating E-cycle services on a large scale in major mainland Indian metropolitan cities like Bengaluru, Mumbai, or Delhi. However, in this process, the traveller rides the cycle by self. But the ride sharing of E- cycle service have not yet started within large networks like Uber or Ola in the Northeast. Therefore, implementing this model here will mark a new beginning. In this process, the traveller does not ride the cycle by himself or herself. He/she has a driver. The leader of that system can make an app for connection. Thousands of people can join the community and make money from it. Moreover, due to the narrow roads, constant traffic congestion, and the necessity for short-distance commuting in our cities, the E-cycle will prove to be a hundred percent practical and efficient medium.

## IV. STEPS FOR SUCCESSFUL IMPLEMENTATION

To successfully implement this research-based model in reality, some basic infrastructure will be required:

- Dedicated Cycle Tracks: Safe tracks must be constructed along the side of the main roads of our cities for the movement of E-cycles.
- Charging or Battery Swapping Stations: Establishing battery swapping stations at various locations in the city will allow drivers to provide services rapidly without wasting time.
- Government Subsidy: Since it is an eco-friendly technology, if the government provides subsidies or tax exemptions for purchasing E-cycles, its adoption will be accelerated.

## V. CONCLUSION

From the conclusions of this research, it is evident that the use of E-cycles in popular transport services like Uber and Ola is one of the best engineering and economic solutions of the present times. Especially for the growing cities of Northeast India and Assam, it is not only a shield against the shortage of petrol-diesel and skyrocketing price hikes, but it is also an effective tool to protect our global ecosystem from the brink of destruction. By establishing the E-cycle as a mode of public transport through proper planning and technological application, our local economy will be strengthened, and human society will move toward a green, healthy, and sustainable future.

## REFERENCES

[1] H. B. Choudhury, “The Universal Power Conclusion: The Ongoing Project About the Combo of Science, Technology and Mathematics,” 2026.