

# Mobilizing Electric Vehicles (EV) in Rural India

Pioneering an Inclusive and  
Equitable Transition

Pilot beneficiaries in  
Anand District, Gujarat  
with their newly  
purchased EV two-  
wheelers



Transport infrastructure is the backbone of economic development and social well-being. In rural areas, enhancing mobility holds significant potential to uplift communities dependent on agriculture, farming, and small businesses as their primary source of livelihoods. Empirical data reveals that a lack of adequate transportation infrastructure in villages is a major hindrance to these communities for realizing their full developmental potential. With nearly two-thirds of the Indian population based in rural areas, the need for inclusive and equitable clean mobility solutions is more critical than ever.

Access to clean mobility solutions can be transformative for livelihood opportunity growth in rural India. By adopting clean mobility alternatives, small farmers can mitigate their present risk of losing more than 30% of their post-harvest produce due to poor storage and transport infrastructure. Rural entrepreneurs, especially women, with access to commercial centres can thrive. Mobility solutions for women entrepreneurs can help reduce drudgery and enhance safety. Vehicles can also reduce the physical effort of carrying heavy loads. Moreover, the introduction

of electric vehicles could augment electricity demand in villages. For this, rural micro-grids can be used – presenting an opportunity to utilize the existing solar assets and enhance their economic sustainability in villages. The key is to provide mobility through electric vehicles without compromising the environmental integrity of the surroundings.

Owning a two-wheeler in villages is not just for transportation, it is a symbol of independence that provides economic freedom and an improved access to markets and small businesses. This is driving growth in two-wheeler sales in villages. Rural India already accounts for 55% of two-wheeler sales nationwide, with a 13% year-on-year increase. While electric two-wheelers are gaining traction nationally, constituting 56% of the total EV sales in FY 2023-24, deeper inroads into the rural market remains to be made. To address this, NRDC in collaboration with partners Self Employed Women's Association (SEWA) and the Small Industries Development Bank of India (SIDBI), initiated a pioneering EV pilot in January 2024.



**Prior to the pilot, the participants, who travelled approximately 200 km to 350 km per week, would regularly spend 20% – 40% of their total family income on vehicle fuel, maintenance and repairs.**



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### **Busting EV Myths**

“I had no idea about electric two-wheelers until I attended a session organized by SEWA and NRDC. It was there that the benefits of owning an EV were explained to me. Everyone in the village used to say that an EV battery would burst in the heat and catch fire. Despite my initial fear, I decided to buy myself an electric two-wheeler. Today, I am proud that I made that decision as the EV allows me to get to work faster while also saving me money on fuel and public transport.”

**Rinkuben Suthar, Resident of Vasad Village**



## Challenges in Rural Mobility: Limited Infrastructure for Seamless Commutes

In many cases, rural communities continue to face mobility challenges around accessibility, safety and affordability. The reason for that is geographical diversity, rough terrains and lower population density. Rural-road infrastructure and services can uplift agriculture, commerce, trade, industry and provide access to education, jobs and healthcare. Yet, rural mobility receives less attention than its urban counterpart. This disparity exacerbates inequalities between India's urban and rural areas, creating a cycle of underdevelopment and limited opportunities.

The most common mobility solutions in rural India include walking and the use of highly polluting internal combustion engine (ICE) vehicles. For most of the rural population, two-wheeler vehicles remain the predominant mode of transport. This pilot aimed to address mobility challenges in rural areas. This included long distances between public transportation access points, lack of auto-rickshaw availability, exorbitant fares, longer commute time and high fuel and maintenance costs for their personal internal combustion engine (ICE) vehicles. Prior to the pilot, the beneficiaries travelled approximately 200 kms to 350 kms per week and would regularly spend 20% – 40% of their total family income on fuel, maintenance, and repairs



### Early Adopters as EV Ambassadors

“I have been using the electric two-wheeler to sell goods around villages. It feels comfortable as compared to my previous two-wheeler. I like that there is a lot of space to carry my goods. I also use it to go to villages to participate in SEWA's Swaccha Akash Campaign. After having seen me with the electric two-wheeler, at least 10 to 12 SEWA sisters have shown interest in buying a similar vehicle.”

**Kailashben Kunwar Chauhan, Resident of  
Gamda Village**

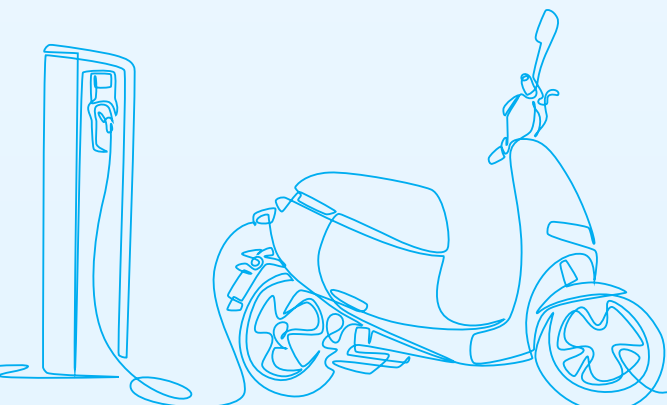
## Initiating Change Through Rural E-Mobility Demonstration Pilots

In navigating EV transition in rural India, identifying the most suitable mobility solution and form factor is key. This necessitates a meticulous evaluation encompassing technical and financial considerations. For this pilot, NRDC and SEWA developed a framework that assessed mobility needs, travel patterns, payload capacity for transporting goods, access to electricity and the willingness to shift to EVs.

To facilitate the transition, we developed a detailed financial model to bridge the price difference between electric and ICE vehicles. The financial model that included a sensitivity analysis, played a pivotal role in

assessing the feasibility of EV adoption in rural areas. This ultimately shaped the purchase transactions of electric two-wheelers. The original equipment manufacturer and vehicle were also carefully considered, as this represented the initial introduction of EV technology to the beneficiaries who are SEWA sisters.

The criteria to identify the early adopters included lack of vehicle ownership, access to clean energy for EV charging, regular long-distance travel, and a commitment to utilizing the vehicle for livelihood improvement. Despite challenges such as limited electricity access, nearly 50% of the survey respondents were willing to take out loans to buy EVs because lowered fuel costs offset the additional loan expenses. We also assessed financial parameters such as willingness to pay and provided financial support in the form of loan and grants. These strategic steps lay the foundation for a thought-through and effective transition to electric mobility in rural India. Monitoring these financial and non-financial parameters will determine the impact of this pilot on the lives and livelihoods of the EV owners.





Beneficiaries of the rural mobility pilot from Gujarat with representatives of SIDBI, NRDC India, SEWA and Gujarat Energy Research and Management Institute. Image Source: NRDC

## Testing Electric Mobility in Rural India

Focusing on Anand district of Gujarat and Dungarpur district of Rajasthan, the pilot deployed 10 electric Ather two-wheelers to SEWA members residing in each of the districts. Seven months into the pilot, the beneficiaries travelled a distance of 26,800 km on their electric scooters and approximately saved 1000 kg CO<sub>2</sub> emissions. Beneficiaries of the pilot reported improved access to mobility, reduced expense on fossil fuel and renewed confidence in EV performance and safety. They reported that the electric scooters increased their ability to access markets and efficiently carry out their work. The pilot participants also shared that electric scooters are user-friendly and have more storage space, which made the transportation of goods easier as compared to ICE two wheelers. Within a month of switching to EVs, beneficiaries reported substantial travel-cost reduction and the monetary savings were used to pay the equated monthly instalments (EMI) of e-scooter loan.



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### Asset Ownership Through Saving on Fuel Costs

“I did not own a vehicle before I bought an electric two-wheeler from SEWA in January 2024. This has been an affordable vehicle because I save money on fuel and use that money to pay the EMI of my EV instead. It has been my dream to own a vehicle in my name and that’s been made possible by SEWA.”

**Renuka Laxman Ahari, Resident of Modara Village**



## Developing a Financial Ecosystem for Rural E-Mobility

Finances are often a barrier to purchasing EVs. To help address this, NRDC and SIDBI launched the 'Empowering Women and Enhancing their Business through E-Mobility (E-WEE) scheme' through SIDBI's E-Mobility initiative. The scheme provides concessional loans for EV financing for beneficiaries. For the E-Mobility initiative, SIDBI partnered with SEWA, Original Equipment Manufacturers (OEMs), Non-Banking Financial

Companies (NBFCs) like Revfin and Accelerated Money for U (AMU) Leasing to provide affordable financing options to SEWA sisters for the purchase of electric two- and three-wheelers. NRDC, in collaboration with SIDBI and its empanelled OEMs & NBFCs, carried out awareness programmes and product demonstrations in villages across Gujarat and Rajasthan.



SEWA sisters participate in the product demonstration by TVS Motor company in Dungarpur District, Rajasthan, in July 2024.  
Image Source: SEWA

### Affordable Solution for Improving Accessibility

"I used to own a petrol scooter and often the cost of petrol was higher than traveling in an autorickshaw. Earlier I used to drive my scooter up to the autorickshaw stand and change my mode of transport there. After buying the electric two-wheeler, there's been ample cost saving for me. I no longer need to take an autorickshaw to save money while commuting."

**Sangitaben Bhavansinh Rathod, Resident of Nagano Math Village**





The success of these efforts have generated interest for e-mobility solutions. NRDC continues to partner with OEMs and conduct product demonstrations with SEWA sisters. We are also working with SIDBI and SEWA to operationalize the country's first risk-sharing facility for financing EVs in rural areas. NRDC aims to expand this pilot program to include other vehicles such as electric tractors, to demonstrate viability and benefits, and help inform national and state agricultural mechanization schemes and EV policies. We are also working towards aggregating the demand for EVs amongst SEWA's four million members who are spread across 21 Indian states. These rural e-mobility initiatives will provide valuable insights and lessons for the Global South on how to make the clean mobility transition more inclusive and equitable.



Dr. R.K. Singh, Chief General Manager, SIDBI hands over the electric scooter to a beneficiary in Anand, Gujarat Image Source: NRDC



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