RESEARCH REPORT

Electrifying India's Micro Food Vendors: Income, Impact and the Path to Scalable eCooking Adoption

Shell Foundation

UKaid Transforming Energy Access

Finovista

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List of Abbreviations

Abbreviation	Full Form
AC	Alternating Current
Amp / A	Ampere
AOV	Average Order Value
BREDA	Bihar Renewable Energy Development Agency
BRPL	BSES Rajdhani Power Ltd.
CAPEX	Capital Expenditure
CCC	Clean Cooking Champions
CLASP	Collaborative Labelling and Appliance Standards Program
DC	Direct Current
eCooking	Electric Cooking
EESL	Energy Efficiency Services Ltd.
FGDs	Focus Group Discussions
FSSAI	Food Safety and Standards Authority of India
FVs	Food Vendors
GW	Gigawatt
IC	Induction Cooktop
IFCA	Indian Federation of Culinary Associations
INR	Indian National Rupee
IR	Infrared Cooktop
JEEViKA	Bihar Rural Livelihoods Promotion Society, locally known as JEEViKA
JWiRES	JEEViKA Women Initiative Renewable Energy and Solutions Pvt. Ltd.
kW	Kilowatt
LPG	Liquefied Petroleum Gas
MCD	Municipal Corporation of Delhi
MECS	Modern Energy Cooking Services Programme
MFIs	Micro-Finance Institutions
MUDRA	Micro Units Development & Refinance Agency Ltd.
NASVI	National Association of Street Vendors of India
NECP	National Efficient Cooking Programme
OPEX	Operating Expense
PM-SVANidhi	Prime Minister Street Vendor's AtmaNirbhar Nidhi
PMEGP	Prime Minister's Employment Generation Programme
PNG	Piped Natural Gas
SF	Shell Foundation
ToT	Training of Trainers
UID	Unique Identification
USD	United States Dollar
UT	Union Territory
W	Watt

1. Executive Summary

India's informal food-vending sector is estimated at close to ten million micro-enterprises operates at the intersection of energy use, informality, and low-margin and entry barrier livelihood systems. While the country has achieved near-universal household electrification, productive-use access for micro-vendors remains uneven. Barriers such as low sanctioned loads, absence of formal documentation, and limited awareness of electricity as a viable cooking fuel constrain the ability of vendors to benefit from newer clean-cooking technologies. These constraints formed the rationale for this research programme, funded by the Shell Foundation and executed by Finovista, which supported 760 vendors with eCooking deployment across Delhi and Bihar to assess the feasibility of electric cooking for street vendors under real operating conditions.

The study examines how vendors incorporate eCooking into their workflows, how usage evolves over time, and what patterns emerge in income, expenditure, working conditions, and fuel choices. The evidence shows that adoption is incremental. Vendors begin with low-risk tasks and gradually extend electricity use to more intensive cooking activities as familiarity develops. *Over the three-month period, electricity use as a primary cooking fuel increased from less than 1% to 24%,* accompanied by reductions in LPG dependence and a marked decline in the use of traditional fuels such as coal and firewood. These changes coincide with improvements in stall conditions, including lower heat exposure, reduced smoke, and cleaner cooking areas—factors repeatedly referenced by vendors as influencing their daily operations.

Operational patterns also shifted in ways relevant to business performance. Vendors reported shorter preparation cycles, greater ability to manage parallel processes, and fewer disruptions tied to heat or smoke. *These adjustments align with the income data: 75% of vendors reported income increases, largely within the 10–20% range*. Meanwhile, vendors who did not report income gains still indicated improvements in comfort and operations that may shape outcomes over longer time horizons. These observations illustrate how changes in the working environment and process efficiency can influence vendors functioning.

The cost structure of cooking energy also shifted. LPG consumption reduced sharply, *88% of vendors saved one cylinder per month*, and others saved two or more, while traditional fuel use declined across both primary and secondary applications. Electricity expenditure increased for most vendors, but modest as compared to the savings made from reduction in LPG and traditional fuels. *71% of vendors reported net monthly savings, with most directing these toward household needs, better life or business reinvestment.* These findings indicate a rebalancing of monthly cooking-energy spending that, for many, results in greater financial flexibility.

Technology performance was generally favourable when devices were matched to cooking style, cookware, and load availability. Vendors valued precise control over heat, lower effort, and safer operation. At the same time, constraints appeared for high-heat frying, large-batch production, and round-bottom cookware, underscoring that a single device type cannot meet the needs of India's heterogeneous street-food economy.

The pilot revealed that the documentation mismatch faced by informal vendors is not only a barrier but also a clear commercial opportunity for utilities. A group of vendors who wished to participate could not formalise their electricity connections because standard documentation requirements do not align with informal vending practices. If addressed, this segment represents a sizeable new customer base with stable, daytime demand, precisely the kind of load growth utilities seek. As eCooking adoption expands, formalising these connections becomes a direct pathway for utilities to secure sustained revenue while improving safety and compliance. This creates a strong case for utilities and policymakers to work

together to simplify documentation procedures and build vendor awareness of required steps, enabling a larger share of the micro-vending sector to transition into regulated electricity use.

Gender-related insights were significant. Women vendors and helpers reported reduced heat burden, lower cleaning time, and improved comfort conditions, that shape their ability to sustain long working hours. Women enumerators and local partner played a critical role in improving data quality, trust, and vendor engagement, especially in Bihar. Their involvement strengthened the behavioural and monitoring components of the programme, highlighting the value of gender-responsive approaches in clean-energy delivery.

Environmental and macroeconomic implications are non-trivial. Fuel-use shifts during the pilot resulted in *97.26 tons of CO_2 mitigation over three months*. If even 7–8% of India's micro-vendors transition to eCooking, the programme could contribute an estimated *409,500 tons of annual CO_2 mitigation and INR 5 billion (USD 59.9 million) in avoided LPG import expenditure.* These figures illustrate the potential for demand-side electrification within informal food systems to generate meaningful climate and foreign-exchange benefits.

The study shows that electric cooking can operate as a viable commercial option for food vendors when devices, cookware, wiring, and field support are aligned with the realities of their workflows. Vendors benefit through clearer cost visibility, reduced exposure to fuel-price shocks, greater control over preparation cycles, and improved working conditions, creating a business case that links operational stability with the possibility of higher daily throughput. For the government, substituting a portion of LPG demand with electricity reduces pressure on import expenditure and subsidy outflows. For utilities, eCooking represents a new stream of predictable load in a segment that has historically contributed little to billed consumption; simplifying connection pathways and enabling electrical readiness allows utilities to convert this latent demand into sustained revenue. Collectively, the findings position eCooking as a practical convergence point for vendor livelihoods, utility economics, manufacturing innovation, and clean-energy transition goals. The findings provide a practical evidence base for designing a scale-up programme that intersects clean energy, livelihood strengthening, and urban development priorities.

2. Introduction & Project Overview

2.1 Introduction

India is now a power surplus nation; official figures show that the entire country is connected to the grid[1] and with a strengthened distribution system, which has increased the power availability of up to 21.9 hours in rural areas and 23.4 hours in urban[2] areas. India's growth trajectory aligns with a structural shift in its energy mix; renewable sources now account for more than half of installed capacity—an achievement reached five years ahead of the 2030 target[3]. Despite this progress, approximately 442 million people[4] in India still lack access to clean cooking solutions and rural areas still predominantly use biomass, while urban areas rely on LPG/PNG for cooking. LPG Import dependence is 60% of supply[5], represents a USD 120 billion savings if electricity is adopted for cooking and mobility.

India has a large number of micro eateries that could benefit from access to clean cooking technologies, such as street food sellers, tea/coffee stalls and shops selling freshly cooked food. These businesses are hyper-local, deeply embedded in their communities, and have a high representation of women, either as direct Food Vendors (FVs)s[6] or as the primary cooks in home-based processes. The sector is structurally informal, highly fragmented, and largely absent from formal enumeration. No authoritative census exists on the number of vendors. Indicative estimates suggest that roughly 2% [7]of the urban population is engaged in retailing, with 20–30% operating in food vending. Practitioner assessments argue that the actual scale is much higher, potentially reaching 10 million food vendors when rural vendors are included.

The vendors dominantly practice a traditional flame-based cooking, facing the dual brunt of rising cost of LPG prices and health and safety hazards posed by cooking on open flames. High heat exposure during summer contributes to fatigue and discomfort, which can slow or interrupt cooking activity. When operating hours are reduced, vendors report corresponding declines in daily sales and income. Further, some regulations in urban areas also restricts the use of flame -based cooking in commercial buildings, airports, cultural festivals hosted in secured zones and list is growing. These problems coupled with government's push to reduce LPG import bills, subsidy on LPG and progress in electrification highlights the emerging opportunity for eCooking transition for this segment. However, there is a lack of specific data and business models for the adoption and scale-up of eCooking devices in this segment.

Through the participation of 760 vendors, primarily women, in Delhi and Bihar, this research seeks to establish whether clean electric cooking should be prioritized as a key productive use case for India's informal food sector and assess its impact on vendor's income, under real operating conditions and whether such a transition is technically viable, economically feasiable, and operationally reliable for vendor-level enterprises. Potential co-benefits—lower emissions, reduced heat stress, improved safety, and greater convenience, were reviewed in relation to actual field performance rather than assumed advantages.

[1] https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1992405#:~:text=Every%20village%20and%20household%20has%20been%20electrified.,it%20has%20increased%20up%20to%2023.8%20hours.
[2] https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2037000
[3] https://www.pib.gov.in/PressReleasePage.aspx?PRID=2183866
[4] EESL Newsletter June 2023
[5] https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2035035
[6] https://www.theeconomicsjournal.com/article/view/410/7-2-100
[7] https://www.fssai.gov.in/upload/knowledge_hub/5ab3802273f60Clean_Street_Food_Brochure.pdf

2.2 Project & Research Objective

The primary objective of this project is to conduct applied research to assess the feasibility, business case, and scalability of electric cooking (eCooking) adoption among street food vendors in India. Specifically, the project aims to:

- Validate Technology Feasibility: Evaluate the technical suitability and operational performance of eCooking devices in real-world street vendor settings, considering diverse cooking practices and infrastructure constraints.
- Assess Business Models: Identify and test viable business models that can support the adoption and sustained use of eCooking solutions by street vendors, with a focus on affordability, supply chain readiness, and after-sales support.
- Identify Barriers and Enablers: Systematically document the key barriers to adoption, including technological, financial, behavioral, and infrastructural challenges, as well as the factors that facilitate successful transition to eCooking.
- Demonstrate Impact on Livelihoods: Quantify the effects of eCooking adoption on vendor income, operational costs, business growth, and working conditions, with particular attention to the experiences of women vendors.
- Generate Evidence for Policy and Scale: Produce actionable insights and proof points to integrate government initiatives, such as the National Efficient Cooking Programme (NECP), and to support the integration of productive use of electricity for street vendors in national and state-level clean energy programme.

The work examined the entire transition system: the performance of available electric devices, the adequacy of wiring and sanctioned load, the compatibility of cooking processes, the financial implications for vendors, and the reliability of supply-chain and service arrangements. The assessment focused on whether a scalable model could be defined without compromising daily earnings, operational continuity, or vendor risk exposure.The findings are intended to guide policymakers, utilities, financiers, and development partners in designing effective interventions for large-scale, sustainable adoption of eCooking technologies.

3. Project Methodology

The applied research was conducted in two Indian states and the report relies on information from three major sources i.e.:

- Status of eCooking Technologies, suitable for Food Vendors.
- Findings from baseline and Outcomes from Research Deployment
- Stakeholder consultations with Government, Utility, Vendor, Industry Association, Financial Institution, Manufacturer, Researchers, Policymakers and Hospitality Industry.

3.1 Project Locations and Partners for Research

The applied research was conducted across several districts in two different locations i.e. Delhi (Northern India) and Bihar (Eastern India). A total of 760 vendors were engaged, 550 vendors in Bihar and 210 vendors in Delhi. These two locations reflect varied street-food cooking practices across rural, semi-urban, and urban settings. This diversity enabled assessment of how eCooking devices function under different cuisines, heat requirements, and operating conditions. The geographic spread provided a wider set of observations and contributed to a more comprehensive understanding of use patterns. The project was implemented with the support of ground agencies, viz JEEViKA Women Initiative Renewable Energy and Solutions Pvt. Ltd. (J-WiRES) in Bihar and National Association of Street Vendors of India (NASVI) in Delhi. Both agencies utilised their extensive local networks to identify and reach vendors across districts.

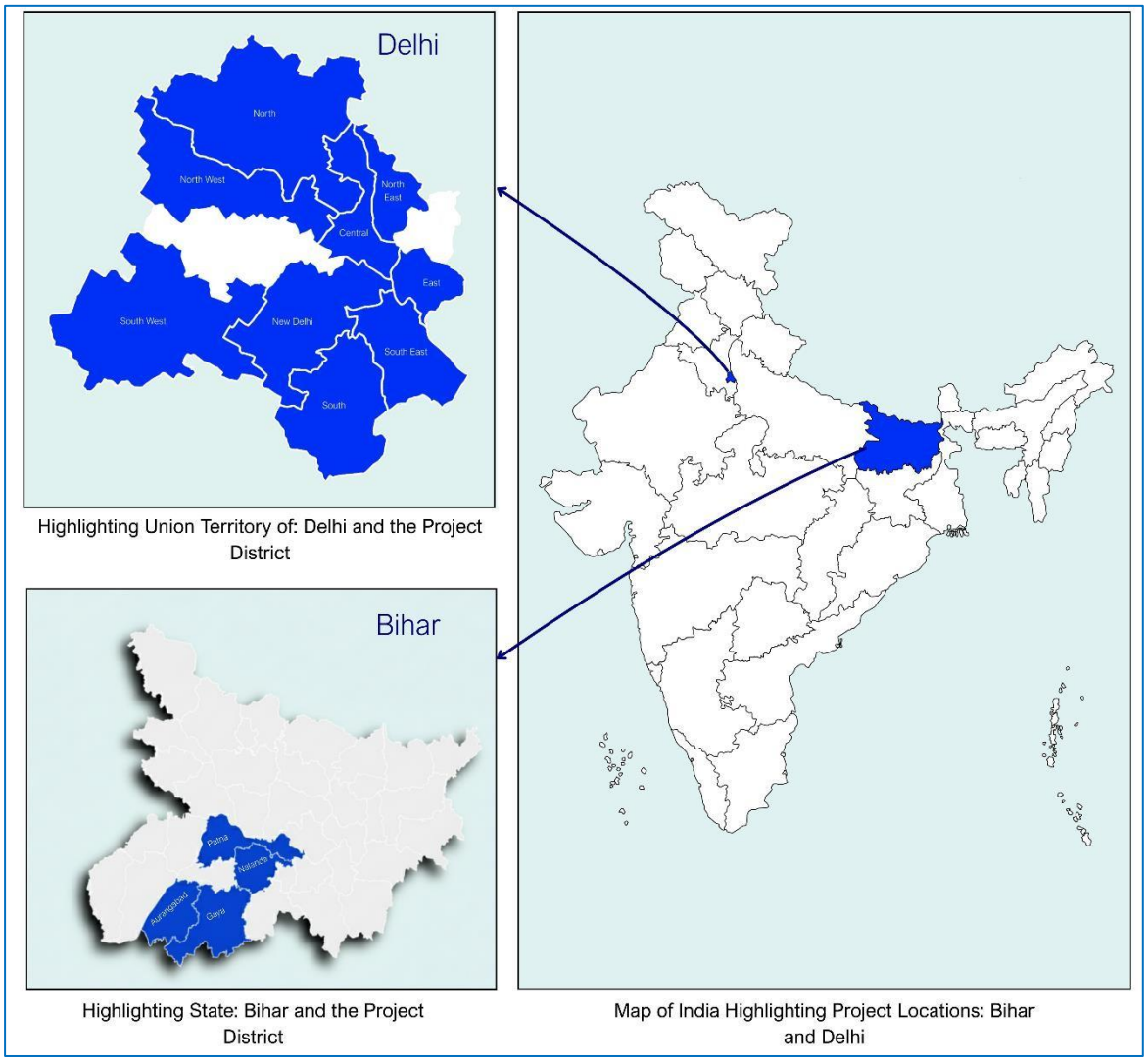


Image 1: Pictorial Representation of State Maps of Bihar and Delhi along with the districts where the project has been implemented.

3.2 Conducting Baseline Study for Vendors

The baseline study was focused on gaining comprehensive insights about the vendors, their business and cooking practices. It also focused on understanding their business challenges, impact on livelihood creation, their customers etc. The following were a part of the baseline study for Vendors:

- Research Design: In alignment with the research objectives, the questionnaire was designed with key inputs from stakeholders, think tanks, ground agencies and experts in the conjunction of energy and livelihood domains. The questionnaire was formed using the Airtable tool (Annexure-1), ensuring real-time visibility of responses and enhanced accountability. It consisted of 30–40 carefully designed questions. The tool provided a detailed view of Demographics, Business and Stall profile, Energy Access and Usage, Cooking Practices, Cooking Energy, Business Operations and economics.

- Training-of-Trainers (ToT) programme: Enumerators from the ground agencies in their respective locations were onboarded. This followed a comprehensive Training-of-Trainers (ToT) programme which was conducted to equip field enumerators and survey teams, both online and on-the-ground, for effective data capture using the online survey tool. It also helped in giving practical insights to the field officers on the type of questions and challenges that could arise on ground.

- Field Engagement & Baseline Survey: Subsequently, a comprehensive baseline survey was conducted across Delhi and Bihar to identify suitable vendors and ensure the effective deployment of eCooking devices. The survey gathered vital insights forming the foundation for informed decision-making and targeted implementation.

- Implementation Approach: Trained field enumerators visited each vendor, conducting in-depth interviews using airtable, both quantitative and qualitative insights. This ensured that the data reflected ground realities and captured details data of socio-economic and operational contexts.

Image 2: Discussion with Steet Food Vendors in Delhi regarding the eCooking project

3.3 Stakeholder Consultations, Inaugural Workshops & Technology Demonstration & Training

To contextualize the research within broader clean-cooking and energy-access initiatives, stakeholder consultation was held with government agencies, utilities, financial institutions, manufacturers, industry associations, and research organizations. The consultation focused on product standardization, financial access, infrastructure readiness, behavior change and policy support to enable large-scale adoption among street vendors in Delhi and Bihar. Stakeholders also discussed the opportunities and challenges from scale-up of eCooking for food vendors and highlighted the gaps in evidence to support policy design for scale-up. (Annexure 2)

Inaugural workshops were organised in Delhi (Annexure-3) & Bihar (Annexure-4) to introduce the programme and familiarise participants with the range of available eCooking technologies. Sessions included live demonstrations, hands-on practice, and stakeholder addresses. Manufacturers showcased induction and infrared cooktops, and trained cooks from the local communities demonstrated real-time cooking processes, allowing vendors to assess the relevance of various devices to their own cooking routines. These workshops served as the formal start of field implementation and enabled cross-learning among vendors, field teams, and technical experts, while providing a structured environment to evaluate device suitability. The Delhi workshop saw engagement from bodies like FSSAI, MCD, EESL, BRPL, NASVI, and NIDAN, while Bihar workshop engaged JEEViKA, BREDA, utilities, and leading appliance manufacturers.

Live demonstrations by trained women users and Clean Cooking Champions helped vendors understand device performance, suitability, and real-time benefits. Hands-on interaction and peer learning increased vendor confidence and interest in switching to electric cooking. Availability of multiple manufacturers demonstrated a competitive market, offering solutions for diverse cooking needs.

Image 3: Panelist sharing insights on benefits of eCooking with Street Food Vendors in Bihar

3.4 Vendor Selection Methodology

A pre-baseline assessment covering more than 1,100 vendors was undertaken to understand their cooking volumes, customer load, electricity access, and willingness to experiment with electric cooking. Based on this assessment, 760 vendors were selected using three core criteria:

- Stable electricity access and basic electrical infrastructure, ensuring devices could be used safely and consistently.
- Willingness to participate, which was essential for reliable monitoring over the study period.
- Feasibility of cooking their primary dishes on electric devices, so that results reflected realistic operational conditions.

Selecting vendors through these criteria ensured a well-distributed sample representing the socio-economic and operational diversity of street-food enterprises. The final cohort included varied stall types, cooking processes, and business scales across Delhi (urban/semi-urban) and Bihar (rural/semi-urban). This allowed the study to evaluate eCooking performance across different real-world environments and ensured that findings are grounded, comparable, and relevant for future scale-up.

Image4: Glimpse of live cooking demonstrations on eCooking devices during the Inaugural workshop in Bihar

3.5 The project Implementation Involved:

- Technology Deployment for Vendors: A custom-built deployment airtable form (Annexure 6) was created to capture all relevant details at the time of deployment. This included vendor information (name, address, contact number, Aadhaar number), device specifics (brand, serial number, model, and unique identification number), and the cookware provided. Each vendor was assigned a unique UID based on their state and the type of technology deployed. This system ensured that all deployment data was digitally recorded, easily traceable & verifiable and output was reflected in dashboard format.

- Communication Collateral: As part of the pilot, vendors received not only the eCooking devices and cookware but also communication materials to help them inform customers about their shift to clean cooking. A short two-line slogan in local language (Hindi) was printed on posters, danglers, and aprons to explain that their food and beverages were now being prepared on clean, and safe electric cooking without affecting the taste and environment. The posters and danglers made the stalls look more visible inviting and engaging. The aprons helped vendors appear more hygienic and organised, and their customer can appreciate it.

Image 5: Communication collaterals in use: Vendors installed the banner and dangler at their stall in Bihar

Each vendor also received a simple Do's and Don'ts flyer to guide them on safe and proper use of the device with electrification. Overall, these communication materials helped create awareness and supported vendors in presenting their stalls in a more clear and organised way and customer inviting.

- Capacity and Training of Field Officers & Vendors: Field officers were provided hands-on exposure to each type of eCooking device deployed under the programme. They were trained to operate, maintain and troubleshoot the devices, as well as to demonstrate proper usage techniques to vendors. This practical exposure equipped them to handle on-ground challenges confidently during the project period. During rollout, vendors were trained for the device operation, temperature control, cookware compatibility, energy efficiency, and safety practices.

- Engagement with the Delhi Utility: A formal electricity connection was a prerequisite for participation in the pilot, given the safety requirements and the load needed for electric cooking. As part of the baseline exercise, 231 vendors in Delhi were surveyed; 210 vendors (90.9%) reported having an existing connection. The remaining group lacked formal access due to requisite documentation gaps. The project's engagement with BSES Rajdhani Power Ltd, Delhi based Utility, clarified that the primary barrier was procedural rather than technical.

Most excluded vendors operated from informal or semi-formal locations and did not possess documents typically requested by utilities, such as Tehbazari permits, business registrations, or site-specific authorisations. Without these, applications could not be processed within the project timeframe. The utility was open to supporting new connections, but the time required to establish acceptable proof of vending location exceeded the deployment window.

These constraints explain why the project could not include vendors without existing electricity access. They also point to a broader systemic issue: the intersection of informal livelihoods with formal utility procedures. For large-scale eCooking adoption, addressing this gap will require simpler documentation pathways, streamlined approval processes, and coordinated support between urban local bodies and Utilities, ensuring that eligible vendors can obtain safe and reliable connections in a reasonable timeframe.

Image 6: Capacity Building and Hands on Training on eCooking Devices to Field Enumerators

- Monitoring, Handholding and Transition Support: A weekly visit to the vendors by the field enumerators was done to support them in the transition through discussion, training, and resolving the technology related challenges. Field teams maintained regular contact with vendors, conducting troubleshooting sessions, performance checks and follow-up training. Initially, vendors faced operational challenges, but consistent handholding helped integrate eCooking devices into their daily cooking routines. For the monitoring (Annexure 7) and endline phases (Annexure 8), questionnaires were further revamped on airtable tool, linking with the baseline and deployment stages. The questions were carefully designed to capture key insights on vendors' revenue, footfall, eCooking-related savings, investment intentions, and operational challenges during the transition.

- Focused Group Discussion: Five Focus Group Discussions (FGDs) (Annexure 9) were conducted to gather detailed insights. These discussions helped in gathering qualitative insights beyond data from survey focusing on experience of using the devices in their daily operations, aspects of usability, safety, savings, operational constraints, and willingness to invest.

Image 7: A Glimpse of Food Vendors participating in the Focused Group Discussion in Delhi

3.6 Glimpses of Vendor Training & Monitoring of eCooking Devices

Image 8 –Capacity Building & Hands-On Training on eCooking Technologies in Bihar

Image 9- On Ground Monitoring and Training of Vendors in Delhi

4. Limitations of the Study

The findings in this report should be interpreted in light of the practical constraints under which the pilot operated. The study was implemented over a short duration in informal and highly variable market environments, limiting the ability to observe seasonal shifts, long-term behavioural stabilisation, income trajectories, or device durability. Participation was restricted to vendors with formal electricity connections and minimum wiring adequacy, creating a necessary but selective sample that represents the more infrastructure-ready segment of the market rather than the full breadth of informal food vendors. Device performance was shaped by on-ground electrical conditions, sanctioned load, socket quality, wiring integrity, and cookware compatibility, which meant that several high-heat, continuous-throughput cooking processes could not be tested at full intensity, and results therefore reflect feasibility within current constraints rather than the technical ceiling of electric cooking. Measurement precision was also limited: electricity use and cost estimates rely on vendor-reported bills rather than metered data, and income and expenditure insights draw on short recall windows, constraining the strength of economic inference. The geographic scope, focused on Delhi and Bihar, offers useful diversity but does not represent the full heterogeneity of India's street-food economy, tariff regimes, or infrastructure conditions. Finally, several devices particularly concave infrared and first-generation induction variants were deployed in vendor settings for the first time, and their long-term maintenance patterns, servicing pathways, and supply-chain robustness remain untested, meaning performance observations reflect pilot-stage conditions rather than mature market behaviour.

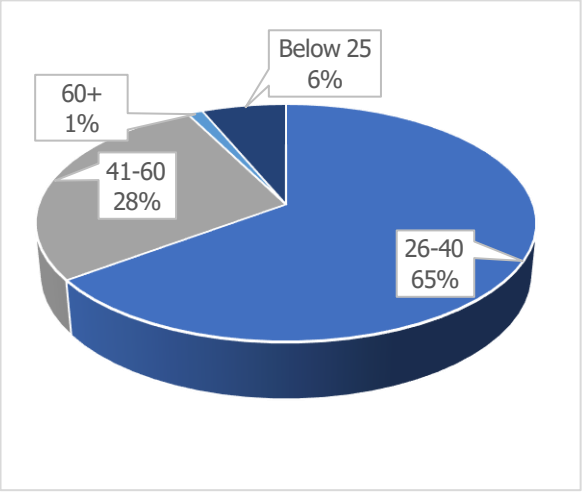
5. Findings – Baseline Study

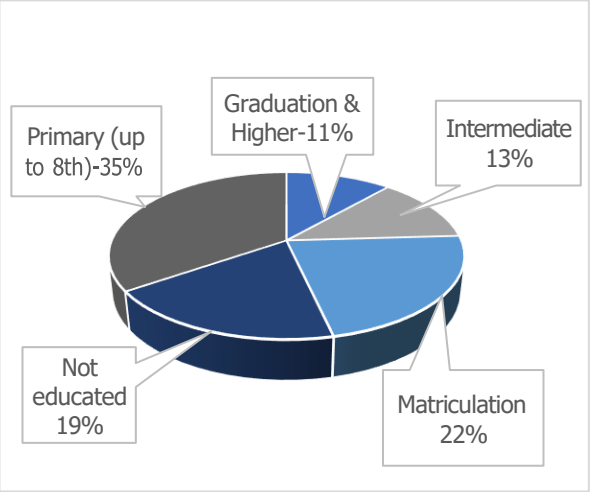
This section details the baseline study of vendors, focusing on their social and economic backgrounds, employment generation, daily operations, income patterns, food preparation methods, and energy usage. It covers aspects such as vendor demographics, family-member support, business models, the types of foods sold, diversity in cookware, predominance of LPG & traditional fuel for cooking, the connection between business and household finances, and their patterns of electricity access and expenditure, all providing a contextual foundation for understanding daily realities and operational challenges of vendors in India.

5.1 Socio-Economic Profile

Vendors in India is a cornerstone of livelihood generation within the informal economy, both in urban and rural areas, due to its low or no entry barriers, minimal investment, no formal education or skill requirements, and the flexibility to involve family members while balancing domestic and business responsibilities. For many young people from resource-starve background, the sector offers an accessible path to self-employment. Evidence shows that targeted support for the informal sector could unlock large-scale job creation and contribute meaningfully to alleviating poverty, local economic support and boosting GDP. Research findings reinforce these dynamics:

- *71% of vendors are below 40 years [Graph 1], indicating that youth enter food vending early and continue long term, often due to limited alternative job options linked to low education or skills.*
- Only 11% of vendors have education beyond Class 12 [Graph 2], reflecting limited formal qualification in the sector.
- Women make up 52% of vendors, though distribution varies by region; they contribute both as stall owners and as invisible workforce supporting from home, often juggling long working hours between vending and household duties.





Graph 1: Percentage of Age Group of Vendors participating in the project & Graph 2: Education Level of Vendors

- Cart Operations and Livelihood Generation

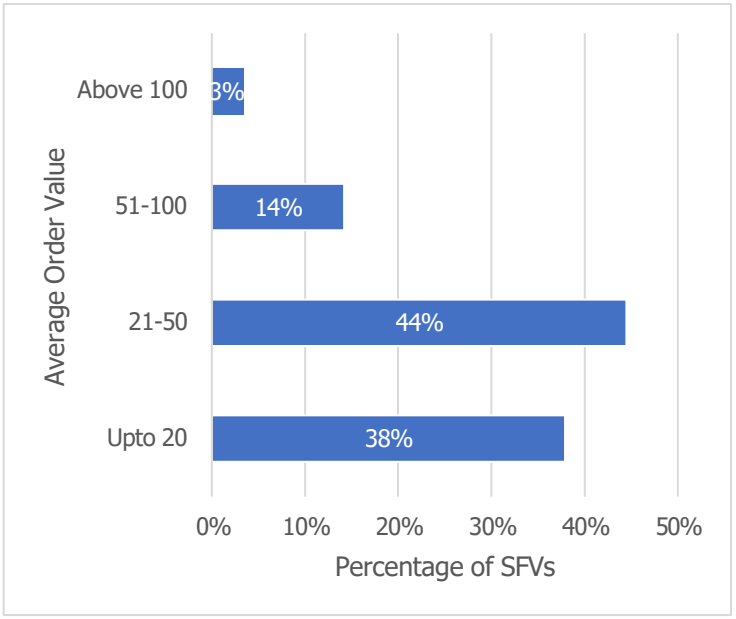
As highlighted in the above sections, we focused on vendors with a fixed business location and have stable electric connection. The study highlighted that vendors primarily service a limited and defined catchment area, operating from their stalls in mostly fixed location; even the ones using mobile vending carts, they still tend to remain stationary within a set location or circuit during their working hours. Amongst the 760 vendors participated, 67% reported running their operations throughout the day, reflecting a strong commitment to continuous operations.

Others establish stalls only during specific windows viz morning, afternoon, or evening, tailoring their presence to the rhythms of local schools, offices, tourist sites, and similar settings. Regardless of their schedule, these vendors are substantial sources of livelihood, supporting both the proprietors and a broad network of support staff.

Across the 760 outlets studied, food vendors collectively support the livelihoods of over 2,007 people, and each vendor enables about 1.79 additional jobs beyond their own family members, highlighting the broader economic and livelihood impact.
Family involvement forms the backbone of stall operations: *61% of vendors report engaging one or more family members at their stalls*. Financially, these vendors are deeply intertwined with household budgets, as vendors rely on joint business and family funds for both capital expenditure (CAPEX) and daily operational expenses (OPEX). As a result, operational management is largely entrusted to capable family members, vendors consider them to be the most capable and reliable in ensuring business continuity.

- Revenue and Footfall

Millions depend on vendors for their daily food and nutrition needs, drawing a diverse customer base composed of both regulars and occasional visitors, shaped by the specific meals on offer. Many people get the meals from these vendors and not able to get from the home. Price competitiveness is central to these businesses; vendors keep prices significantly lower than restaurants or eateries to attract customers who rely on their offering daily needs of food. These vendors fulfil a substantial demand for daily fooding needs of snacks and hot beverages, driving high footfall but generating low average order values. The findings demonstrate robust daily activity: *63% of vendors serve at least >50 customers* per day. Despite this footfall, average order values remain low, with *82% of vendors reported AOVs approx. INR 50* [Refer to Graph 3]. As a result, most vendors experience modest daily revenues, *with 60% sells products worth around INR 2500 per day*.



Graph 3: Breakdown of food vendors based on their typical average order value

5.2 Cooking Practices: What's cooking and how?

The diversity of Indian cuisine is very well reflected in the vendors with a range of Indian traditional dishes, snacks, international dishes, hot beverages being prepared on these stalls:

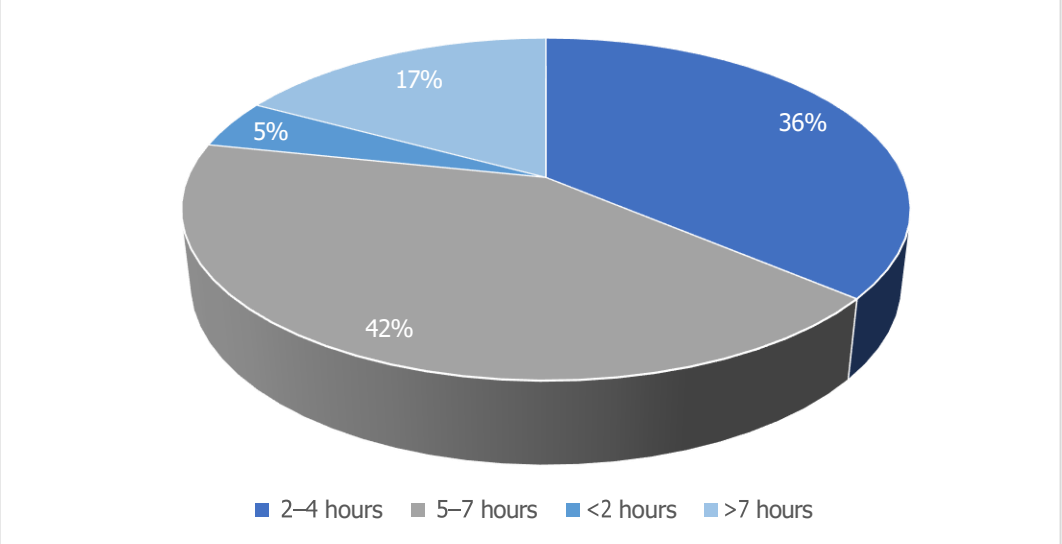
- Types of Food and Cooking Process: Hot tea and coffee, alongside snacks predominantly characterised by deep frying, constitute the principal food types available across street vendor stalls. Quantitative analysis indicates that a *substantial proportion of vendors (58%) specialize in hot beverages*, namely tea and coffee, positioning this as the most prominent category within the sample population. In addition to beverages, a cohort of these vendors concurrently offers various snack items.

Another significant segment is fried snacks, *with 38% of vendors preparing culturally iconic foods such as pakoras, samosas, and kachoris*, elements central to the Indian street food landscape.

Further menu diversity is evidenced by steamed and quick sauté items, *with 22% of vendors serve dishes like Maggi noodles, boiled corn, and assorted Chinese offerings*. The cooking techniques are directly influenced by food type, displaying a pronounced prevalence for boiling and deep frying. Demand for boiling extends beyond finished dishes to raw material preparation, encompassing vegetables, pulses, cereals, and milk. The dataset underscores that the actual range of offerings may be greater with broader geographic sampling, reflecting local preferences and operational variables. Ultimately, the preponderance of boiling, deep frying, and high flame sauté cooking emerges as the dominant food preparation modalities employed by street vendors.

- Cookware: Vendors employ a diverse and highly specialized range of cookware(Annexure10), optimizing their utensils for both the type of dish prepared and the service volume required. For many vendors, cookware is a durable asset, routinely used for as long as 5 to 10 years, highlighting its value within their operational framework. The predominant materials are metals, with aluminum majority selected for patilas/pots, saucepans, and pressure cookers, while iron dominates in tawas and kadais/woks due to its thermal properties and robustness. The cookware landscape is dynamic, with vendors continually adapting their selections to evolving culinary requirements and market opportunities. Cookware size varies according to both customer demand and the batch-cooking requirements of specific food types. For example, tea vendors rely on large patilas (15–20 litres) for bulk boiling, while smaller saucepans (3–5 litres) facilitate fresh batch preparation. Notably, steel cookware is less commonly used among surveyed vendors, reflecting material preferences shaped by cost, function, and tradition. Cookware choices continue to evolve, with incremental innovation and adaptation reflecting changes in menu, service requirements, and vendor strategy.

- Cooking Time at Stall & Base Kitchen: Analysis of cooking location reveals that approximately *70% of vendors prepare food entirely at their stalls*, while others rely predominantly on home-based (base kitchen) preparations, leveraging a fixed business location. This demonstrates a strong trend toward on-site cooking, driven by operational requirements to provide freshly prepared meals directly at the point of sale. Vendors utilizing home kitchens often engage family members in the preparatory process, with this proportion rising for businesses offering items that demand extensive pre-cooking, such as deep-fried and steamed/quick sautéed foods including samosas, potato fries, momos (dumplings), and chaat, which require significant preparatory effort. Street vending is distinctly labor-intensive, as is reflected in reported daily engagement with active cooking.



Graph 4: Distribution of vendors according to their daily cooking duration.

The research indicates that *17% of vendors cook for more than 7 hours per day, while 42% average 5 to 7 hours*, and the remaining segment report up to 4 hours of cooking time. These metrics substantiate the high-demand nature of food vending and provide essential operational benchmarks for understanding vendor workload and resource allocation. [Graph 4]

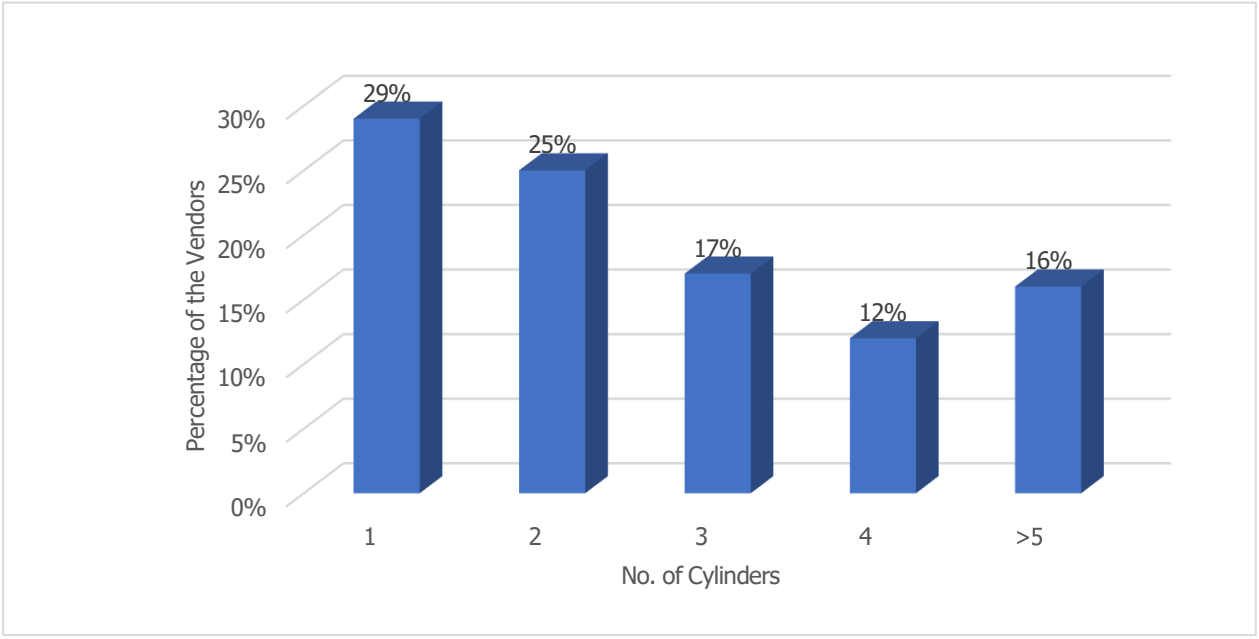
5.3 Cooking Energy – Access & Usage

LPG constitutes the primary cooking energy source with 95% of vendors, with 4% utilizing traditional fuels such as firewood and coal, and less than 1% relying on eCooking technologies like hot plates, induction, or infrared cooktops. Although the market now includes a range of innovative electric cooking devices, with rising induction and infrared awareness, the penetration at usage level remains marginal among surveyed vendors. Notably, fuel stacking behavior is limited, as only *12% report employing a secondary fuel for cooking*; among these, traditional fuels account for 72% of secondary use. Vendors cited specific factors influencing their reliance on traditional fuels:

- The high cost of LPG cylinder refills leads vendors to strategically ration usage, prioritizing business continuity while containing refill-related expenses & logistical challenges and minimizing large, single-point cash outflows.

- Regional food preferences, especially in Bihar, reinforce this dependence; food items like litti and chokha require high-flame roasting, and vendors reported that customers prefer the smoky flavour imparted by traditional fuels, rejecting preparations made with LPG or electricity. Vendors further observed that active coal or firewood stoves visibly attract customers, many believes it ensures foods are freshly cooked.

- Among those relying on LPG, *14.2 kgs domestic cylinders are used by 80%* of vendors, while *19 kgs commercial cylinders are used by 14%* and the remaining *5% usages 5kg cylinder* or even smaller, flexible refill options. The economic burden of LPG refills is substantial: *45% of vendors refill three or more cylinders per month, and 16% refill five or more cylinders monthly*. [Graph 5 for Cylinder Refills].

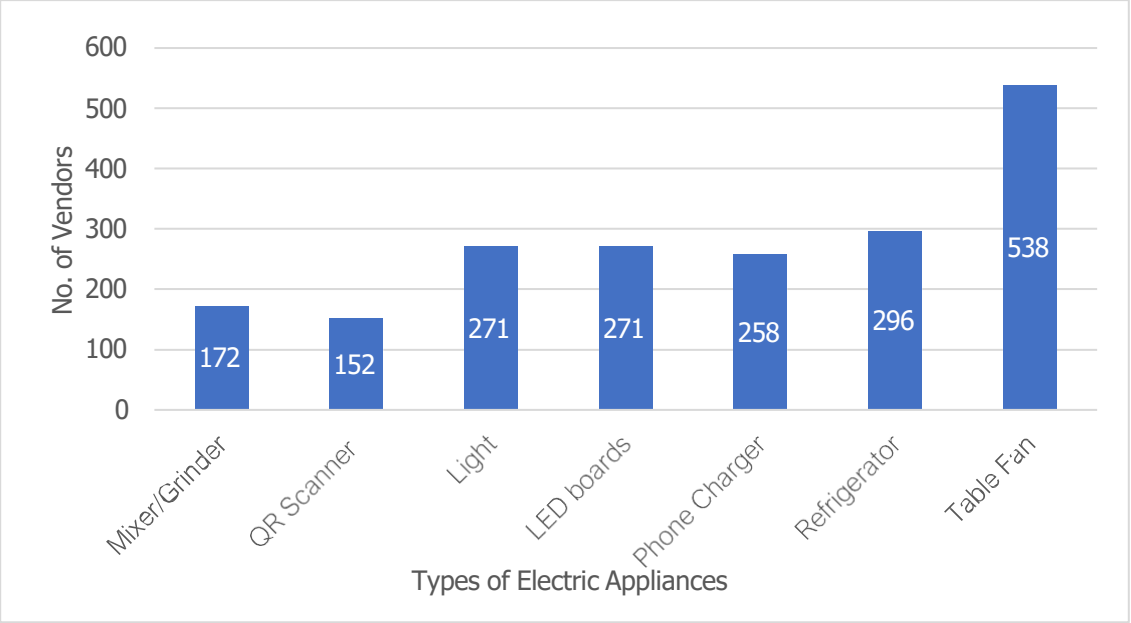


Graph 5: Monthly LPG cylinder refill frequency among food vendors.

5.4 Electric Access, Infrastructure & Usage

- While vendors have an electric connection, *only 84% of vendors report actual plug points at their cooking area*, with the remainder relying solely on battery-powered devices or makeshift wiring without proper connections. Within the population, *59% utilize commercial electricity connections* and *41% have domestic connections*; *76% are sanctioned load of 1kW and 20% of 2kW*, enabling the support of basic lighting, fans, and small appliances at a unit cost of *INR 7–8 per kWh*.

- Electricity usages amongst vendors overwhelmingly supports non-cooking purposes, primarily for lighting, cooling, digital transactions, and device charging, reflecting modest electric use for core food preparations. The most frequently usages include bulbs, tube lights, and fans, with a minority for mixers and grinders for ingredient processing [Graph 6]. Most of these electric devices are low powered devices and which most of them being used for less time durations.



Graph 6: Electrical appliances commonly used by food vendors at their stalls

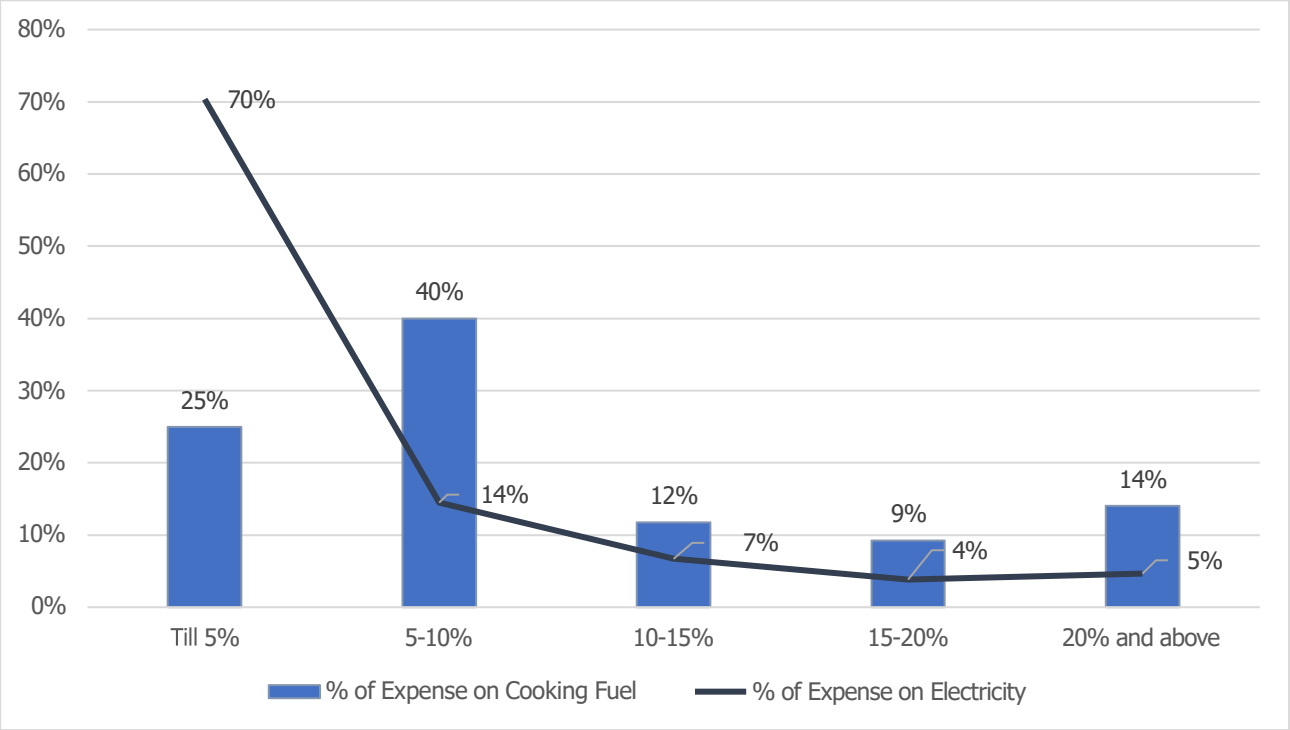
- Infrastructure quality presents marked variability: *64% of vendors benefit from insulated and fixed wiring*, while *34% contend with temporary or hazardous wiring configurations*, introducing safety risks. In terms of capacity, *46% possess robust High powered plug points (16 A) suitable for high-wattage appliances*, marking differential readiness for advanced electrical appliance integration across the sector.

5.5 Expense on Cooking Energy Vs Electricity:

Field observations and analytics confirm that vendors predominantly operate with limited-power and minimal-use electric appliances within shop environments, resulting in exceptionally low electricity expenditure in relation to overall cooking energy costs.

The graphical representation and images substantiate this finding, showing equipment setups where high power demand is relegated to cooking, not ancillary shop functions. This dynamic is chiefly due to the widespread adoption of LPG cylinders as the dominant fuel source, coupled with the universal use of non-standardized, inefficient commercial burners.

- The requirement for sustained high-flame operations directs vendors towards commercial burner designs: *64% of surveyed vendors utilize commercial burners*, which supply the requisite heat profiles for quick and large-volume cooking.
- Conversely, the remaining vendors rely on domestic burner variants, which typically offer less thermal performance and adapt better to smaller batch preparation. Economic analysis, as depicted in [Graph 7], highlights a pronounced imbalance in energy-related expenditure.



Graph 7: Percentage share of expenditure on cooking fuel versus electricity.

Share in Expenditure - Cooking Energy Vs Electricity

- *70% of vendors reported that, 5% of their total expenditures goes towards electricity*, despite *96% reported robust energy access and 60% having commercial electrical connections*.
- A *substantially large number of vendors, i.e. 35% spend more than 10% on LPG and other cooking fuels*, whereas electricity costs stagnate at ultra-low levels related to basic shop operations.

These data patterns indicate a considerable untapped opportunity for integrated interventions, advancing the uptake of energy-efficient electric cooking devices could reduce the disproportionate burden of fuel expense, leverage existing grid connectivity and enhance operational efficiency. Cooking fuel expenses are not prominently factored, at least at present, as it is invisible expenses and but hits hard unpredictably with high adverse impact. This would address not only the economic imperative for vendors but the broader sectoral goals of energy transition and emissions reduction, supporting enhanced productivity and long-term business sustainability.

6. eCooking Technology – Assessment, Supply Chain & Retrofitting

The detailed baseline findings were analysed to determine which electric cooking technologies were suitable for vendors' real operating environments. The findings examined five core factors:-

- Cookware type and size
- Food categories and cooking processes
- Customer footfall and daily volumes
- Overall energy demand
- electrical capacity of each stall

Together, these parameters established the practical requirements that any device would need to meet.

Cookware was a critical consideration. Vendors rely on vessels they have selected over years of practice i.e. large aluminium pots, round-bottom kadhais/woks, concave pans, and heavy multi-litre vessels. These choices shape workflow, heat distribution, and perceived food quality. Because of this diversity, relying solely on induction cooktops would have created immediate compatibility barriers. The assessment showed that many vessels were non-ferromagnetic or too large for induction plates, and replacing them would increase cost and slow adoption.

Cooking processes were mapped across heat intensity and duration—boiling, sautéing, steaming, frying, and continuous simmering—along with the quantity of food prepared and number of customers served. These patterns helped estimate peak heat loads and the ability of devices to maintain throughput without affecting service speed. This analysis made clear that different vendors required different heating technologies and wattage bands.

Electrical readiness further shaped technology selection. Variations in sanctioned load, wiring quality, distance of plug-points from the cooking area, and availability of safe circuits determined which devices could be integrated reliably without creating risk or overloading the connection.

Using this evidence, vendors were profiled into technology categories rather than being given a single, uniform device. Infrared and concave infrared cooktops were introduced where cookware diversity or size would have made induction impractical. Induction was deployed along with cookware, where processes, and loads were compatible. This approach ensured minimal disruption to existing cooking styles, reduced the learning curve, and lowered the behavioural and operational barriers that typically hinder early adoption. The combined assessment, rooted in real cookware, cooking processes, volume, and electrical capacity enabled the introduction of device options that aligned with vendors' established practices and operating constraints, supporting smoother and more reliable uptake.

6.1 Market Mapping and Technology Procurement

An extensive mapping of the available brands and potential Indian suppliers and manufacturers was conducted. Basis the same, a suitable stake of technologies has been identified and procurement process has been initiated. Along with quotations/pricing the distribution and service network was also shared by the brands. Key differentiations between national and regional brands are highlighted below [Table 1]:

Aspect	National Brands	Regional Brands
Presence	Extensive network across India	Limited to specific states/territories
Service Support	Faster repairs, better spare-part availability, authorized service centers and trained technicians	Possible delays in service, spare parts, and technician availability outside core areas
Reliability	Strong and consistent after-sales support	Support quality depends on location

Table 1: Comparison Between National & Regional Brands

In contrast, regional brands typically operate within specific states or territories and have limited presence in major centres other than there primary geography. Consequently, customers outside their core service regions may experience delays or difficulties in obtaining repairs, spare parts or technician assistance.

Shortlisting of brands and particular models was based on key aspects of: -

- Price Competitiveness
- Lead Time for Procurement
- Distribution and After Sales
- Running Models to ensure that after sales, replacement of device or it's parts would be smoother as needed.

The procurement for Induction Cooktop and Flat Infrared Cooktop was done from a mix of established National and Regional brands while Curved Infrared was procured from a local MSME brand. This company has developed the special product, based on our insight, customer interaction, feasibility and actual requirement by the vendors. *The shortlisted technologies eCooking and Solar cooking technologies are highlighted in [Table 2] and [Table 3]*

Technology Type & Brands	Product Images	Usage	Compatible Cookware	Cooktop & cookware Cost (INR)
1600W Induction Cooktop Brands: Kifahari (Real Flame), McCoy's (V K Group India)	 *Induction 1600W*	• Boiling & light stir-fry. • Lower number of customers (30 per day). • Tea/coffee stalls or quick-food.	Flat-bottom induction-compatible cookware.	2700-3200
2000W Induction Cooktop Brands: V-Guard Industries Limited, TTK Prestige Limited, Bajaj Electricals Limited	 *Induction 2000W*	• Boiling and stir-fry. • Higher customer volume (More than 50 per day).	Flat-bottom induction-compatible cookware.	2900-3500
2000/2200W Infrared Cooktop Brands: V-Guard Industries Limited, TTK Prestige Limited, Bajaj Electricals Limited	 *Infrared 2200W*	• Boiling, steaming, pressure cooking, deep frying, stir frying, & limited roasting/puffing.	All types of Flat - bottom cookware	3100-4000
2200W Concave Infrared Cooktop Brand: Smith Innovative Appliances Pvt. Ltd. (Smithcucina)	 *Concave Infrared*	• Veg & non-veg curries, deep-fried snacks and Indian sweets. • Large number of customers. • Supports roasting and puffing needs.	All existing cookware, including curved, round-bottom and large cookware.	7000-8000

Table 2: eCooking Technologies Deployed

Additionally, 5 units of Solar based devices have been deployed in alignment with induction and infrared cooking technologies, targeting vendors. These systems are were deployed in both project states: Bodh Gaya, Bihar and Madanpur Khadar, Delhi.

S. No.	Solar Systems Configuration	Battery	Inverter	Induction/ Infrared Cooktops	Location	Cost In INR
1	2 kW Solar Systems	6 Hr Power Backup	No	DC Infrared Cooktops (960 Watt)	Gaya, Bihar	120,500
2	2 kW Solar Systems	5 Hr Power Backup	Yes	AC Induction Cooktops (2,000 Watt)	Gaya, Bihar	142,399
3	1 kW Solar Systems	3 Hr Power Backup	No	DC Infrared Cooktops (960 Watt)	Gaya, Bihar	70,500
4	2 kW Solar Systems – Grid Connected, Meter installation for energy reading capturing	No (Direct– Grid Connected)	Yes	AC Concave Infrared Cooktops (2,200 Watt)	Gaya, Bihar	106,600
5	2 kW Solar Systems	5 Hr Power Backup	Yes	AC Induction Cooktops (2,000 Watt)	Madanpur Khadar, New Delhi	142,399

Table 3: Details of Solar Setup Installed for eCooking

6.2 Retro-fitting in In-shop electric infrastructure to accommodate device usage

- Kitchen Readiness – most vendors did not factor the possibility of eCooking while building their shops and kitchens. As highlighted in the baseline there are gaps in shop wiring, some lack the connectivity at cooking station, some lack the availability of 16A plug points, some lack recommended cable gauge, some faced, wiring were damaged or loosely connected with 1 mm² or 1.5 mm² wires not suitable to sustain high power, shortage of plug, MCBs to handle the device load. Thus 62% vendors reported of own upfront Investment for Retro fitment to use the electric cooking devices, highlighting the strong intent for them to explore the potential of these devices. *In several cases, vendors without electricity at their stalls extended connections up to 50–60 meters from home, reflecting strong motivation for cleaner and efficient cooking.* [Table 4]

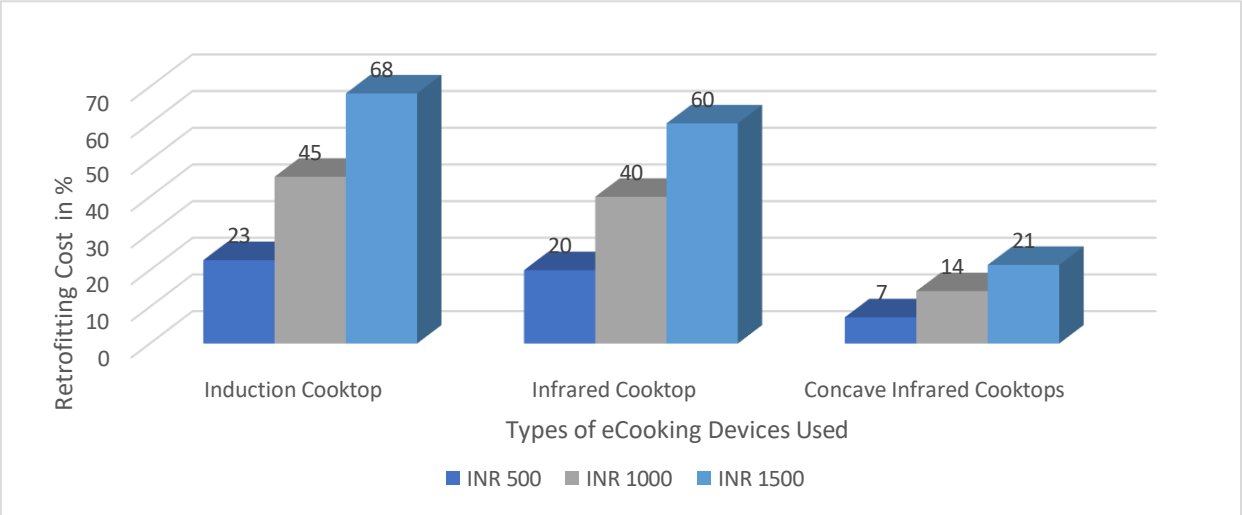
Amount spent towards electrical components

Retrofit Components	Cost Range
Higher Power Sockets[8]	INR 200 – 350 per point
Suitable Wiring[9]	INR 30 – 50 per meter
(MCBs)[10]	INR 200 – 300 per unit
Labour cost (area-wise)	INR 300 – 500

Table 4: Retrofitting Components and Associated Costs

61% of vendors carried out retrofitting to use eCooking devices.
54% spent up to ₹500, 5% spent ₹500–1000, and less than 1% spent ₹1000–1500.

It is important to note that as compared to the upfront device cost, retro-fitment expense in terms of percentage stands higher. Since the prices of Induction Cooktops and Infrared Cooktops vary basis the brand and model type we have assumed that price of Induction Cooktop 2 kW at INR 2200, Infrared cooktop 2.2 kW at INR 2,500 and 2.2 kW at Curved Infrared Cooktop INR 7,000 – [Graph 8].



Graph 8: Retrofitting costs as a percentage of the total device cost

- Total Cost of Technology

Total Cost of Technology = Cost of eCooking Device + Cost of Cookware + Cost of Retrofitting

The cost of technology for eCooking extends well beyond the cooktop. For food vendors, the total outlay is the combined cost of the device, compatible cookware, and the electrical upgrades required to safely operate high-wattage equipment. Given the diversity of cooking processes and the limited readiness of most vending spaces, retrofit expenses form a substantial share of total cost, as reflected in Graph 8 and this cost has been invested by the vendors on an upfront basis demonstrating their strong willingness towards adapting eCooking.

Cookware costs are similarly significant, particularly for vendors who serve multiple food categories and require large-volume vessels to meet customer demand.

6.3 Supply Chain of eCooking Devices

[8] *All the eCooking Devices required heavy duty sockets to connect with electricity for that purpose 16 Amp socket is required
[9] * Few vendors in project location have to change their wiring which is suitable for High Powered eCooking devices i.e 2.5 mm^2 & 4 $mm^{2:}$
[10] * MCB is an automatic electrical switch that protects a circuit from overcurrent caused by overloads

Supply Network: India's electric cooktops market, including induction and infrared models up to 2.5kW, is supported by an advanced distribution and service infrastructure, with differentiated brand offerings:

- There is a robust mix of homegrown and international brands with pan-India operations (e.g., TTK Prestige Limited, Bajaj Electricals Limited, Philips). These brands maintain extensive service networks comprising authorized service centers and trained technicians, particularly in urban and semi-urban regions. This network enables rapid device repairs, high spare part availability, and dependable after-sales support. Products are accessible through multiple channels, including eCommerce platforms, high-street retailers, multi-brand outlets, and modern trade venues. Numerous brands also demonstrate strong regional footprints.

- Regional brands and start-ups typically offer a narrower product range but maintain strong service networks within their geographic reach. However, customers situated outside these core zones encounter challenges in accessing after-sales repair services, spare parts, or technician visits, impacting device sustainability and user confidence.

- *Under its NECP initiative, EESL offers a standardized induction cooktop (1200W)* supported by a national supply chain and a two-year product warranty (exceeding standard market norms by one year). This device is engineered for small-scale "Nano" vendors focusing on limited customer bases and batch cooking applications, delivering targeted reliability and support within the micro-enterprise segment.

- Warranty and After Sales Support: Brands offer a one-year warranty, with transparent processes for defect and malfunction claims (excluding any physical damage to devices). Maintain well-stocked inventory of critical spare parts to enable prompt replacement when needed. When repair is impractical or uneconomical, replacement units must be dispatched promptly to minimize downtime. Minimizing downtime is especially critical for continuity of operations.

- Running Vs Other Model: Across brands, multiple models of induction and infrared cooktops exist, yet sales volumes and market penetration differ significantly by model. The selection process prioritized models with consistent sales performance to mitigate risks related to spare parts availability and after-sales/replacement efficacy at the ground level. Analysis confirms that spare parts for fast-moving (mainstream) models are typically stocked at local service centres, ensuring immediate access for repairs or replacements. In contrast, spare parts for low-moving or premium models are maintained centrally and dispatched to local centres on demand, resulting in inherent service delays and time-lags for users of less common models. This supply strategy optimizes operational reliability for mainstream models but imposes longer wait times for specialized units.

- Challenges with New Innovations

    - Concave Infrared Cooktop *was deployed 1st time under this project in India*. Key Insights on the rough usage by vendors, large cookware sizes supported in the product development with wide cooking zone of 11 inches, sturdy glass top to avoid damage, and the zero thermal expansion of glass of 800 Degree temperature. The device can generate 600-degree temperature.

      Since it is a new technology, therefore the production of these units happened within the project period itself. Thus, it wasn't expected that there would be an evolved supply chain for this product, and we also learnt that at component supply chain had bottlenecks initially, with long lead times and subject to vulnerabilities of international supply chain.

Image10: Visit to Smith Innovative Appliances Pvt. Ltd (Smithcucina) Factory

- DC-powered infrared & Induction cooktops continue to have limited market presence compared to AC-based models. Handful of technology companies are working on this with some pilot scale deployments but no readily commercially available devices. Most of these are made to order and with dispatch time of 10 to 15 days of lead time.

- Rooftop Installation: In the Delhi region, the deployment of solar-integrated cooking systems *faces significant spatial and technical barriers*. Vendor-fixed stalls and carts commonly *lack adequate rooftop or terrace area for installing the full solar cooking solution* (solar panels, battery backup, inverter). This constraint is amplified in scenarios where vendors reside in rented or compact homes, characterized by severely limited usable roof space and the absence of formal rights to rooftop access or adequate sun exposure for shop installations. Such spatial limitations, especially prevalent in dense, rental, or shared-premises environments, represent a major obstacle to adoption. By contrast, *installation feasibility in regions like Bihar (specifically Bodh Gaya) is substantially higher*. *Vendors there typically operate from personally owned homes with dedicated rooftops, or have open shade at the shop or adjacent spaces, facilitating system installation*. This key contrast highlights that spatial limitations in urban Delhi restrict participation and inhibit scalability for solar-integrated cooking technologies. To ensure broad adoption, these barriers must be proactively addressed in rollout strategies, through site selection, design adaptations, or targeted support for vendors lacking infrastructure.

7. Outcomes - Pilot Deployment of eCooking for Food Vendors

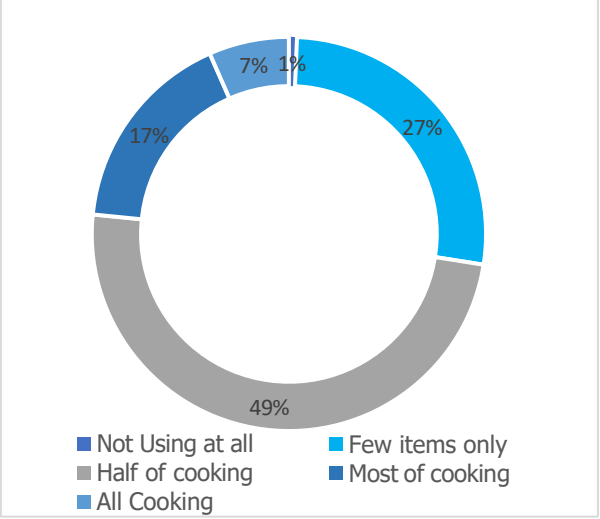
The pilot examined how 760 street vendors adopted electric cooking devices over a three-month period and how this integration shaped their fuel use, operational practices, and user experience. The findings reflect measured behavioral change, device suitability, infrastructure constraints, and the influence of continuous field engagement on adoption patterns.

7.1 Adoption of eCooking by Food Vendors

The transition observed in the pilot aligns with gradual, experience -driven technology adoption rather than abrupt fuel switching. Vendors first incorporated electric devices into specific cooking tasks and gradually adjusted their workflows as they gained familiarity, operational confidence, and clarity on how eCooking fits within their routines. This progression was supported by demonstrations, routine troubleshooting visits, and the availability of devices suitable for their vessels and processes. These early usage patterns provide the basis for understanding the eventual transitions in primary and secondary fuel use. This journey is also reflected in the use of electric cooking as secondary fuel, with time fitment shifting to primary fuel and successfully replacing the use of traditional fuel & LPG for both primary and secondary use.

- Early Integration into Daily Cooking Tasks: During the initial weeks, vendors primarily used electric devices for predictable, low-risk tasks such as boiling, reheating, and controlled simmering. Familiarity increased as vendors observed consistent heating behaviour and reduced supervision requirements. As confidence grew, *82% vendors reported using eCooking for boiling, 50% for frying, and 31% for high-flame cooking,* confirming effective versatility across daily operations for vast cuisine range of cooking processes. By the end of three months, task-level use had broadened significantly, reflecting a functional integration of eCooking into diverse cuisines and workflows.

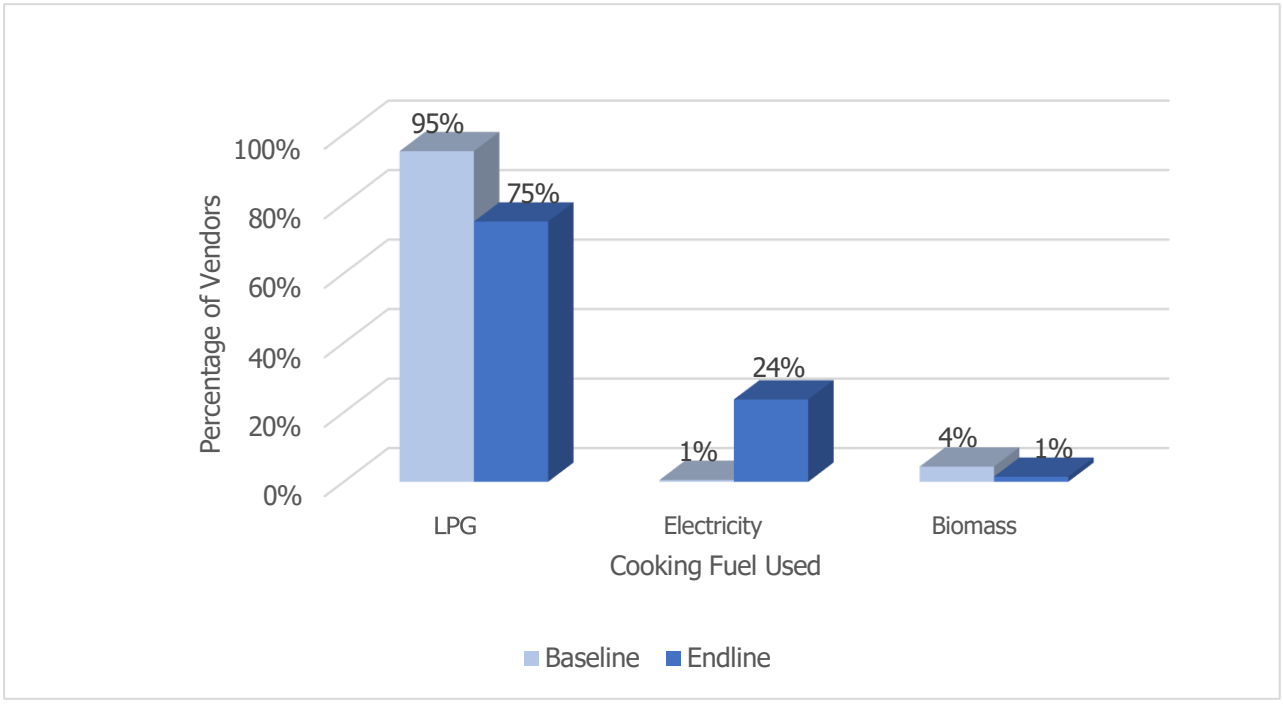
- Increase in Daily Duration of eCooking Use: Time spent using electric devices rose steadily over the three-month period. Initially, most vendors used eCooking for up to two hours a day while testing its suitability. With continued support and improved device familiarity, daily usage increased; by the final month, *49% reported using eCooking for more than half of their cooking requirements with >4 hours of daily operations* [Graph 9]. This increase in duration indicates deeper operational integration before any formal shift in declared primary or secondary fuel type.



Graph 9: Proportion of total cooking carried out on eCooking devices.

- Increased Reliance on eCooking as a

  Functional Burner: As daily usage stabilised, *eCooking became a dependable second or parallel burner for many vendors.* This functional role, especially during peak customer hours, reduced bottlenecks, supported parallel preparation, and offered relief from high heat and smoke associated with LPG and biomass. This shift in practical use preceded, and likely enabled, the subsequent reclassification of primary and secondary fuel roles.



Graph 10: Comparison of Primary Fuel used in Baseline Vs Endline

7.2 Improvements in Working Conditions and Operational Environment

The introduction of eCooking devices produced a clear set of shifts in vendors' day-to-day working conditions, particularly in relation to smoke, heat, and cleaning effort. These changes are operational and reflect how vendors experience their work in small, congested, and often poorly ventilated food-preparation spaces. The data show consistent improvements across cleanliness, comfort, and perceived safety, indicating that eCooking can ease several routine frictions that shape the work environment. These outcomes are linked to the replacement of open-flame cooking with electric devices, which reduce soot accumulation, lower ambient heat, and minimize exposure to smoke. Together, the findings suggest that *eCooking contributes to a more manageable and less physically demanding work setting, with implications for occupational health and the overall functioning of micro-enterprise food operations*.

Outcome - Resulting transition in Primary and Secondary fuel use

- Shift in Primary Fuel Use: At baseline, electric cooking was nearly absent (<1%). After three months, 24% of vendors reported electricity as their primary cooking energy, LPG use as primary fuel declined from 95% to 75%, while reliance on traditional fuels dropped to marginal levels. [Graph 10]. *Reliance on polluting traditional fuels (firewood/charcoal) as primary cooking energy also reduced from 4% in the baseline to just 1% after 3 months.*

- Shift in Secondary Fuel use: The use of eCooking as a secondary fuel also increased sharply. Among those stacking fuels, *41% used electric devices for approximately half of their cooking tasks*. This layered transition indicates that adoption is iterative and shaped by familiarity, risk management, and process-specific suitability.

- Impact on LPG Refills: LPG, refills reduced with *93% of these users reporting a reduction in monthly refills. 88% users reported reducing 1 refill, 10% users 2 refill and remaining 2% more than 3 refills per month*.

Key drivers for eCooking uptake include the dramatic *creation of a smoke-free kitchen environment*, which substantially enhances air quality, comfort, and health outcomes for users. *The emergence of cleaner cooking areas underpins substantial advances in this aspect*.

- Cleanliness & Hygiene - Cleanliness and hygiene improved noticeably as vendors shifted away from LPG and biomass. Vendors reported cleaner cookware, surfaces, and stall surroundings, largely due to the elimination of soot and oil deposits that typically accumulate with flame-based cooking. This reduction in residue decreased the time vendors spent cleaning equipment and walls, resulting in a more orderly and easier-to-maintain workspace. The outcome is a clearer, more hygienic cooking area, which several vendors noted also improves the appearance of the stall to customers. *83% vendors experienced notable improvements in cleanliness and hygiene as a result of eCooking adoption;*

- Smoke & Heat Reduction - Reductions in smoke and heat were among the most consistently reported improvements. In settings where ventilation is limited and fans cannot be used with open flame-based cooking, vendors often experience discomfort and health strain. With eCooking, 79% experienced a smoke-free environment and 89% experienced noticeable reduction in heat levels during cooking.

> "Earlier, I used to cook with firewood and cow dung, which created a lot of smoke and heat. Since I got the eCooking device, my kitchen is smoke-free and cooler"
>
> – Laxmi Devi Gaya, Bihar

Outcomes from Reduced Heat Stress

- 68% find it easier to breathe while cooking.
- 43% reported their eyes are no longer irritated.
- 87% feel more comfortable and less fatigued during extended cooking sessions.
- *24% indicate ability to cook longer hours without discomfort.*

- Safety: Safety also emerged as a significant point of change. Traditional cooking setups expose vendors to open flames, gas leakage risks, and the possibility of accidental burns or fires risks that are more pronounced in crowded, informal vending spaces. With eCooking, vendors reported a marked reduction in these concerns. Devices automatically switch off when cookware is removed, eliminating flame-related hazards, and vendors described increased confidence in cooking while multitasking or working in family-run stalls where children are present. While safety improvements are qualitative in nature, the narratives consistently point to reduced anxiety around accidents and a more controlled cooking environment.

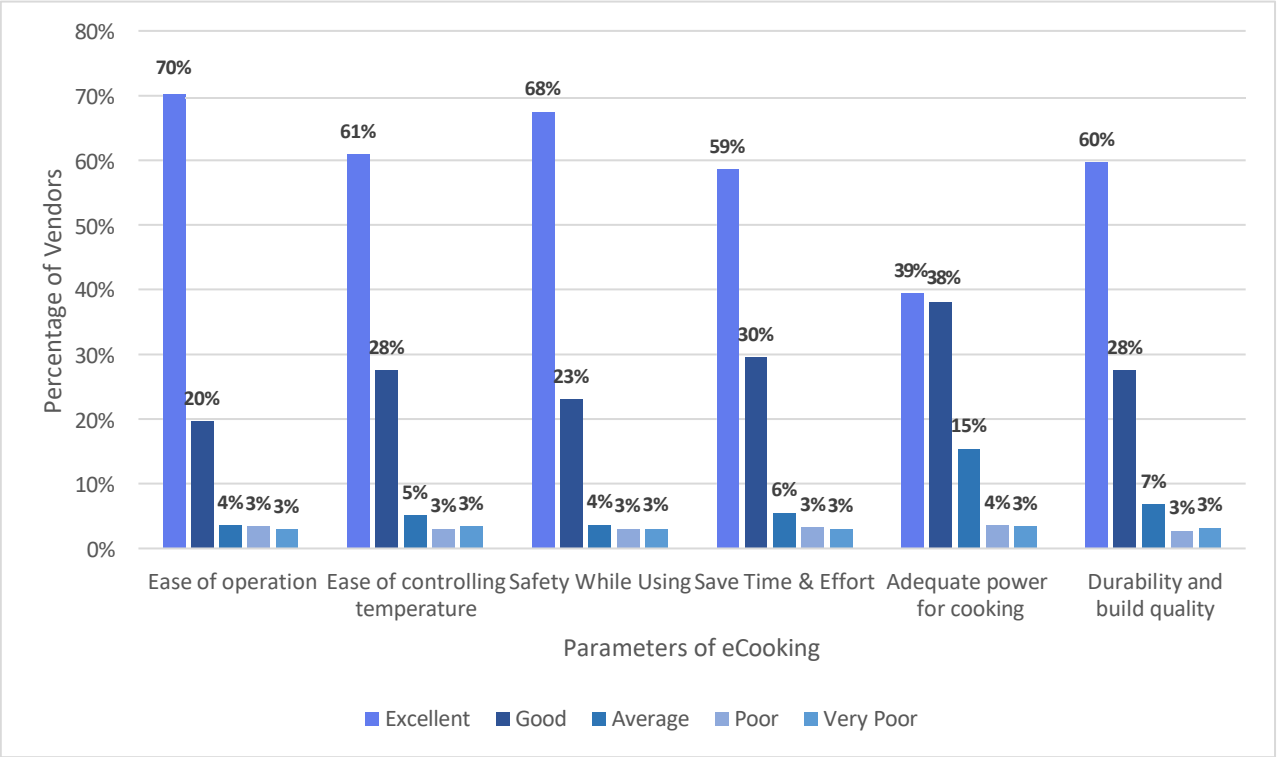
> "By eliminating open flames, flameless cooking creates a safer environment where children can stay near the cooking area without fear."
>
> -Savita Kumari
> Aurangabad, Bihar

7.3 Device-Level Performance and User Experience

The pilot project deployed carefully selected electric cooking devices and compatible cookware, matched to the vendor's unique cooking practices, heat requirements, and food volume needs. Vendor feedback was distinctly favorable: *76% assigned the overall eCooking experience a 5-star rating*. Device adequacy was confirmed by *84% vendors*, with only 16% finding them lacking for specific operational demands. Ratings across core parameters, such as operation, safety, efficiency, cooking power, durability, are detailed below and visualized in [Graph 11]

- Time and Effort Savings: A large proportion of vendors reported that electric cooking reduced their effort for routine tasks. Induction users frequently highlighted unattended boiling modes for tea and milk, which reduced monitoring requirements and minimized spills. Quantitatively, *60% of vendors described the device as faster or more convenient for boiling and sautéing compared with their earlier practice. Infrared users noted clear improvements compared with firewood, although performance relative to LPG varied across cuisines*.

- Ease of Operation: Ease of operation was consistently highlighted. *Around 70% of vendors described the devices as straightforward to use after initial demonstrations*. Buttons, icons, and digital presets helped vendors learn the controls quickly. A few vendors continued support during the first few weeks, underscoring the value of repeated handholding. Several vendors suggested that local-language instructions would further reduce early-stage confusion and speed up adaptation.



Graph 11: Food Vendor's review of eCooking Technology

- Temperature Regulation: *Predictability and stability of heating emerged as a notable advantage. Approximately 61% of vendors reported that the ability to adjust temperature in small increments helped them maintain consistent results for boiling, simmering, and batch preparation. This was especially relevant for tea vendors and those producing repetitive meal components throughout the day.*

- Safety *perceptions improved markedly:* Safety was one of the areas with strongest feedback. About 68% of vendors reported feeling safer while cooking with the electric device compared with LPG and traditional fuels. The absence of open flame reduced concerns about burns, accidental ignition, and handling risks in crowded cooking spaces. Initial fears relating to electric shocks, especially in wet environments, diminished as vendors gained confidence through supervised use and ongoing field guidance.

> "Switching from gas to electric cooking removed the long-standing fear of gas leakage that kept my father from managing our tea stall alone. With safer, faster, and cleaner tea preparation on induction, he now handles the stall confidently—and this change has even allowed me to open a second tea stall."
>
> - Lalu Kumar, Gaya, Bihar

- Cooking Power & Heat output: Responses regarding cooking power showed a clear divergence between vendor groups.
    - 40% described the available heat output as *fully adequate* for their main dishes.
    - 43% found it *reasonably adequate but with some limitations*.
    - 64% of vendors in these categories stated that electric devices did not match the peak intensity of their commercial LPG burners, affecting tasks that require rapid, high-temperature heating.
    - Vendors preparing high-heat items—fried snacks, Chinese cuisine, tawa items, or bulk quantities—reported more constraints.

- Durability and Build Quality: Durability perceptions were generally favourable. Around 60% of vendors described the device as durable or structurally robust during the three-month period. Operational issues were limited: 12 devices across 760 installations experienced malfunction, mostly minor problems related to heating inconsistency or accidental physical impact. The presence of field support reduced downtime and reinforced vendor confidence in device reliability.

7.4 Technology Limitations:

- Insufficient Capacity and Cookware Compatibility: Vendors with high-volume operations or bulk-cooking needs faced notable challenges regarding device capacity and compatibility. With typical cookware ranging from 12 to 50 liters and varying in shape and metal composition, induction and infrared cooktops, optimized for flat-bottomed, steel utensils, occasionally underperformed when used with large, round-bottom or non-steel cookware.

- Lower Power/Insufficient Heating: Relative to commercial burners, electric cooking devices produce reduced flame intensity and heat output, constraining some vendors' ability to achieve rapid, high-temperature cooking and impart distinctive flavours (such as the "smoke" aroma valued in Indian street snacks). This limitation reflected both device ratings and the constraints of local electrical connection loads, requiring deliberate selection of lower-powered models for deployment.

- Single Cooktop Application: Operational workflows for many vendors require simultaneous use of multiple burners (e.g., double-burner LPG setups or dedicated burners for specific meal types). Transitioning fully to eCooking, therefore, will necessitate either multipoint stoves or provision of additional single-zone cooktops to effectively replicate conventional cooking flexibility and throughput.

- Device Malfunction and Inconsistent Heating: Technical reliability was generally high, with only 12 vendors reporting device malfunctions (split between heating inconsistency—2, physical damage—1, and minor issues—9). However, 64 vendors, overwhelmingly those preparing fried or heat-intensive foods, reported inconsistency in delivering and maintaining high frying temperatures. This underscores the sector's need for robust, high-precision electric equipment for deep-frying and similar applications.

- Power Cuts & Fluctuations: Vendors operating in environments with frequent power cuts or voltage fluctuations encountered operational risk due to their complete reliance on eCooking. In a transitioning stage, most maintained a backup supply of LPG to ensure business continuity during outages. While power-related interruptions were generally infrequent, concerns over device safety during fluctuations led vendors to avoid use during periods of instability.

- Behavioral Challenges: The shift to eCooking was shaped by deep-seated habits: many vendors have decades of experience with LPG, which was prized for precision, speed, and consistency. Behavioral adaptation thus varied: vendors in Delhi preparing fast, low-flame foods transitioned more easily, while those producing fried or high-temperature dishes (samosa, poori, noodle) were more hesitant. For many, the absence of visible flame made it challenging to gauge heat, leaving some with the perception that "without flame, it doesn't feel like real cooking." These behavioral and perceptual barriers, compounded by infrastructure constraints, remain key obstacles to seamless eCooking transition.

7.5 Impact on Income

Income shifts observed during the three-month pilot reflect a set of operational adjustments made by vendors as they incorporated eCooking into their daily workflows. These operational adjustments lead to several micro-efficiencies that vendors perceived as beneficial i.e. shorter preparation cycles, cleaner workspaces, reduced heat stress, and smoother customer handling. These changes collectively shaped the business environment in which vendors operated and help explain the income patterns recorded during the pilot, without implying direct causation.

The income for food vendors is influenced by four key factors i.e. the increase in the number of customers visiting their stall, i.e. footfall, increase in the number of food items are ordered by customers leading to an increase in average order value, the ability to service the customers more efficiently and net savings from their fuel expense.

7.5.1 eCooking Transition - Impact on Revenue

The Study highlights that vendors experienced the *improvements in these key operational drivers leading to an increased revenue:*

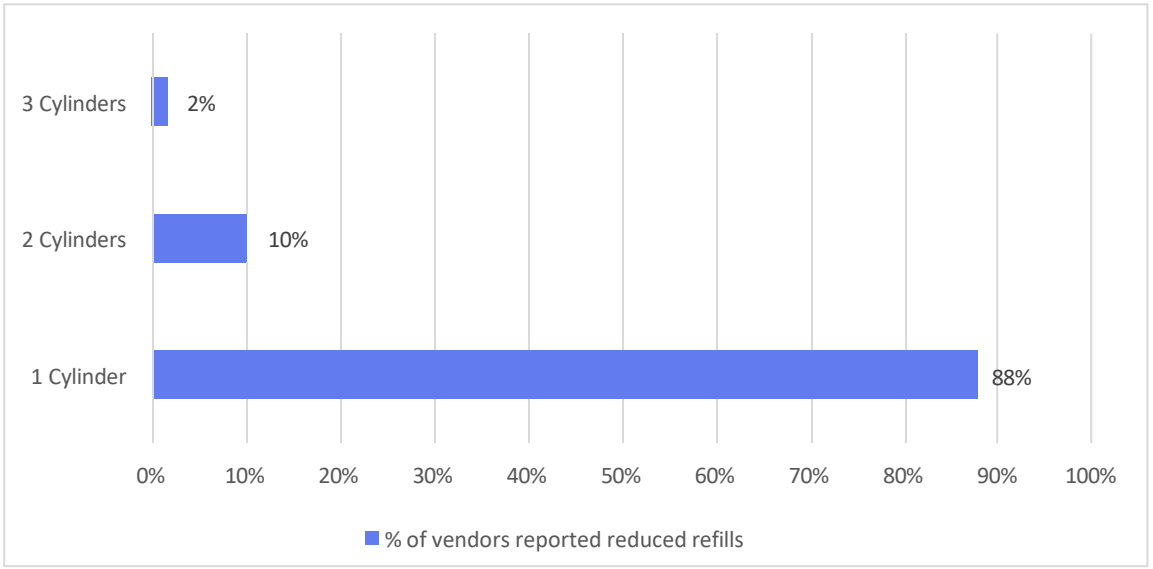
- Increase in Customer Footfall - *43% of vendors reported a slight increase in customer numbers*. Vendors attributed this to incremental improvements at the stall which have led to customer comfort i.e.
    - Fans can be used in cooking sections and at the Stall
    - Reduction of smoke
    - Enhanced hygiene—cleaner cookware and stall surfaces
- Ability to service customers - More than 60% of vendors reported that managing customer orders became easier. With an additional device available, they could divide tasks and handle small parallel processes, reducing waiting time during peak hours. This is again driven by a combination of factors:
    - Vendors are able to optimize time with splitting cooking processes on different devices
    - Customised requirements by clients are now possible with one more device available with the vendors.
- Average Order Value – 44% of vendors reported an increase in average order value (AOV), typically up to ₹20 per order. This was linked to vendors preparing small add-on items more quickly, or being able to serve combinations and side dishes in less time. While modest in absolute terms, small increases in AOV translate into meaningful changes for micro-enterprises operating on low-margin, high-volume models.

> After switching from LPG to an infrared eCooking device, cooking became faster, cleaner, and smoke-free. I can now prepare new items like pizza, serve customers quicker, and offer more variety. My average order value increased from ₹25 to ₹60, raising my monthly revenue from about ₹75,000 to nearly ₹1,80,000. The device has improved both my operations and earnings."
>
> — Shravan Kumar
> Gaya, Bihar

7.5.2 eCooking Transition - Impact on Direct Savings from Reduction in LPG & Traditional Fuel Consumption

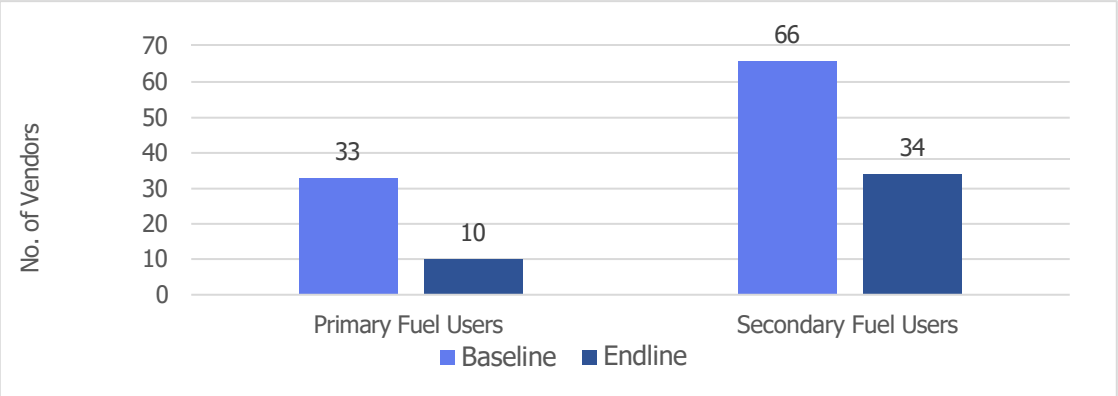
The pilot also resulted in measurable shifts in vendors' cooking-energy expenditure profiles. These changes reflect a reallocation away from LPG and traditional fuels, with a corresponding but smaller increase in electricity costs:

- Reductions in LPG Use: As highlighted in the above sections there were 24% of vendors who started using electricity as their primary fuel. Thus, there was LPG usage reduction both for users using as primary energy and as a secondary fuel source. When we look at the savings of refills, *88% vendors report saving 1 cylinder per month, while 10% report 2 cylinders per month and 2% report saving 3 or more cylinders per month [Graph 12].* The project showcases a positive transition to eCooking with vendors using eCooking for all of their cooking or most of their cooking leading to an *average monthly savings per vendor as 15.9 Kgs of LPG*.



Graph 12:LPG refill reduction reported by food vendors

- Reduction in Traditional fuel: Vendors using traditional fuels have decreased both for primary and secondary cooking use, when there is close to 66% decline in vendors using as primary cooking energy and almost 48% decline in number of vendors using for secondary cooking energy. This has led to collective saving of 105 kgs of Coal, 40 kgs of firewood and 50 kgs of cow dung per month. Mostly coal is purchased while other fuels are collected by vendors with no actual cost but a cost of the productive time which could be utilised for paid labour [Graph 13].



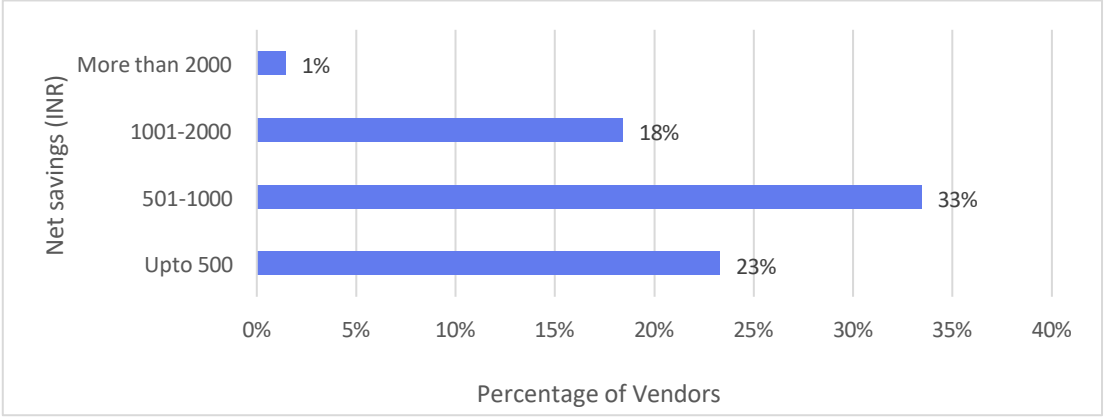
Graph 13 : Reduction in the number of vendors using traditional fuels from baseline to endline

- Increase in electricity expenditure – Almost all vendors have reported that their electricity bills have increased, but since there is no separate meter, they cannot estimate how much of that is because eCooking. For 3% of the vendors this cost is more than INR 1000 per month, while for 41% it is between INR 500 to 1000 and for 56% of the vendors it is up to INR 500 per month.

  Please Note:
  In Bihar, the government provides 125 units of free electricity under the Mukhya Mantri Vidyut Upbhokta Sahayata Yojana[11]. Similarly, Delhi offers 200 units of free electricity for household connections. This support further reduces operating costs for vendors adopting eCooking solutions. This is applicable to vendors who are using their household connections for their stalls since some of these vendors have their homes and stalls at the same location or in close proximity.

- Net Savings: After factoring cost savings from fuel costs and increased electricity expense, most vendors i.e. *71% vendors reported that they are able to manage a net savings from their business. The savings that they are now able to make varies [Graph 14] with more 19% able to save more than INR 1000 per month while 33% between INR 500 to 1000.* *Vendors shared they use this savings in different ways i.e.*:

  - 56% in their Household expenses to live a better life
  - 42% re-invest the same in their business for expansion or buying more raw material to enhance sales
  - 2% save it for future use



Graph 14: Monthly net savings of vendors considering electricity bill increases and reductions in cooking fuel expenditure.

[11] https://www.newsonair.gov.in/bihar-cabinet-approves-125-unitsof-free-electricity-for-domestic-consumers/

- "I have reduced consumptions of 4 cylinders refill per month; saving INR 4,000 on LPG however electricity bill has increased by INR 1,500, which implies net saving of INR 2,500."
  — Ms. Natasha, Patna, Bihar.

- "I used to refill two cylinders per month, now single refill cylinder last for more than a month." — Mr. Rajiv, Patna, Bihar.

Outcome – Impact on Income

A combination of factors that have a positive impact on revenue and net savings from fuel consumption as highlighted above led to increase in income for food vendors. 75% of vendors reported an increase in income, with most gains falling in the 10–20% range and a smaller proportion i.e. 6% reported higher increases of around 30%. Among the 25% of vendors who did not report income gains, many still experienced changes in working conditions that can influence business performance over time. Within this subgroup:

- 71% noted lower heat exposure,
- 70% reported smoke-free or reduced-smoke cooking, and
- over 50% reported faster preparation cycles.

Annualised Increase in Income – Please note that this income data reflects only a three-month period; the annualised increase would be much higher i.e. At least 20% as the benefits add up over time. In three months only a partial transition could be achieved with just 6% vendors transitioning fully to electric cooking and 24% for primary use. We have already learned that the transition is never immediate and with time and practice the usage increases.

7.6 Impact on LPG & Forex saving

As highlighted at the outset of this report, there are approximately 10 million micro-vendors in the food service industry nationwide, spanning street vending and micro-eateries. A successful transition to eCooking, even if adopted by only 7–8% of this sector, has the potential to generate substantial macroeconomic benefits, specifically through reducing India's reliance on imported LPG. Modelling indicates that such a shift could yield foreign exchange savings of USD 59.9 million on LPG imports, underscoring the strategic significance of clean cooking interventions at scale.

LPG is the dominant primary cooking fuel in India and the same is for vendors engaged in running street food stalls and micro-eateries. The project showcases a positive transition to eCooking with vendors using eCooking for all of their cooking or most of their cooking leading to an *average monthly savings per vendor as 15.9 Kgs of LPG* and a cumulative actual LPG savings of USD 27,420 in 3 months (total for 760 Vendors). Further, India imports 60% of its LPG requirement annually and thus there is a high cost of LPG Import which can be avoided by transitioning to electric cooking. From the savings it can be estimated that USD 74.87 of LPG Import cost/per vendor can be avoided annually.

7.7 Impact Carbon Mitigation

Transitioning vendors to eCooking has resulted in meaningful reductions in LPG and traditional fuel use for both primary and secondary cooking, enabling mitigation of 97.26 tons of CO_2 within just three months—equivalent to 0.51 tons of CO_2 per vendor annually. While this progress offers significant climate benefits, it is important to recognize that India's electricity generation remains predominantly fossil-fuel-based. Nonetheless, national advances in renewable energy infrastructure are noteworthy, with 51% of installed grid capacity now sourced from renewables, signaling ongoing improvements in the overall emissions profile of grid-supplied electricity. i.e. over 256 GW[12].

As highlighted at the outset of this report, with approximately 10 million micro-vendors, including street vendors and micro-eateries, operating nationwide, enabling just 7–8% of these vendors to transition to eCooking could mitigate 409,500 tons of CO_2 emissions. This underscores the significant climate benefit and mitigation potential of scaling clean cooking interventions within the micro-enterprise food sector.

7.8 Impact on Women

Women as Food Vendors

Women constitute both the visible and invisible backbone of India's street food and micro-vending sector. While many women directly manage stalls, a large proportion continue to drive food preparation in home kitchens, a role shaped by safety, hygiene, and societal norms. In both direct and indirect capacities, women shoulder comprehensive responsibilities; cooking for families, caregiving, and managing food stalls. Key challenges routinely experienced include:

- Extended working hours of 11–12 hours per day, occasionally reaching up to 15 hours.
- Persistent heat stress in small, poorly ventilated kitchen spaces, causing fatigue, respiratory strain, and diminished stamina.
- Intensive cleaning workload, with utensils accruing major soot deposits from flame-based cooking.
- Financial stress arising from the dual burden of household and stall operating expenses

Findings from the project indicate that 61% of vendors actively participating in business operations are women, who reported the following multiple benefits:

- Significant reduction in cleaning time for vessels and kitchens, allowing more time for leisure and business activities
- Enhanced productivity as lower heat stress permits extended periods for cooking and enterprise management
- Creation of a comfortable, smoke-free and cooler environment for customers, resulting in increased visit duration and sales
- Access to smarter, safer, and more efficient cooking modalities, eliminating much of the drudgery formerly associated with traditional meal preparation

[12] Press Release: Press Information Bureau

Engaging Women as Enumerators and Field Partners

The participation of women from Bihar and New Delhi as enumerators and on-ground partners strengthened the project's field execution, data quality, and vendor engagement outcomes in ways directly relevant to informal and gendered work environments. Their involvement helped build trust with vendors who often operate in sensitive, tightly constrained spaces where external actors are viewed with hesitation. Women field staff were able to conduct longer and more candid conversations particularly in Bihar where social norms influence who vendors speak to, how openly they communicate, and what aspects of household-linked labour they disclose.

- Strengthened trust and access in informal settings: Their presence enabled deeper, more candid engagement with vendors, reducing hesitation in sharing operational and household-linked challenges, and opening access to cooking and preparation spaces that are otherwise restricted.

- Improved data quality and observational accuracy: Women field staff captured richer insights on cooking routines, heat exposure, cleaning burdens, and electrical gaps, supported by closer on-site observation of cookware use, hygiene constraints, and device suitability.

- More effective monitoring and behaviour-change support: They provided consistent follow-ups, documentation, and troubleshooting, while also delivering behaviour-change communication that women vendors and helpers were more comfortable receiving.

- Enhanced field operations and community navigation: Women partners facilitated smoother interactions with local leaders, especially in Bihar, reduced resistance in conservative areas, and offered grounded interpretation of vendor realities essential for accurate analysis and programme responsiveness.


Glimpses from the Pilot
Finovista
आग और धुएं से लें छुटकारा, वही स्वाद, अब स्वच्छ ऊर्जा से बने खाना हमारा!
eCooking


Coca-Cola
Real Magic
Coca-Cola


Finovista
eCooking
आग और धुएं से ले
छुटकारा, वही स्वाद
अब स्वच्छ ऊर्जा से ब
खाना हमारा!

8. Recommendations for Scale-Up

A large-scale transition to eCooking for micro food vendors is best grounded in the behavioural patterns, operational realities, technology performance, and institutional dynamics observed in this study. Adoption evolves incrementally, shaped by day-to-day working conditions and the dependability of support systems rather than technology narratives alone. Stabilisation improves when vendors receive practical demonstrations, ongoing assistance, and access to devices aligned with their cooking requirements. At scale, the emphasis shifts toward enhancing user experience, strengthening ecosystem readiness, building on the business case already demonstrated through this pilot, particularly around cost predictability, workflow efficiency, and income continuity and addressing the underlying operating conditions identified during field deployment.

- Awareness and behaviour change must be designed as a phased, hands-on process rather than one-time training. The study demonstrates that vendors begin with cautious experimentation and their usage expands with repeated demonstrations, weekly follow-ups, and troubleshooting support. Gains such as smoke elimination, cooler workspaces, and the ability to run fans during cooking were far more influential in shifting behaviour than efficiency messages. A large programme should therefore focus on; live cooking demonstrations, local-language instructional aids, structured follow-up in the first couple of months, and FGD-based reinforcement using peer examples. Communication should focus on tangible workplace improvements i.e cleanliness, comfort, heat reduction, time and cost savings rather than just technology benefits.

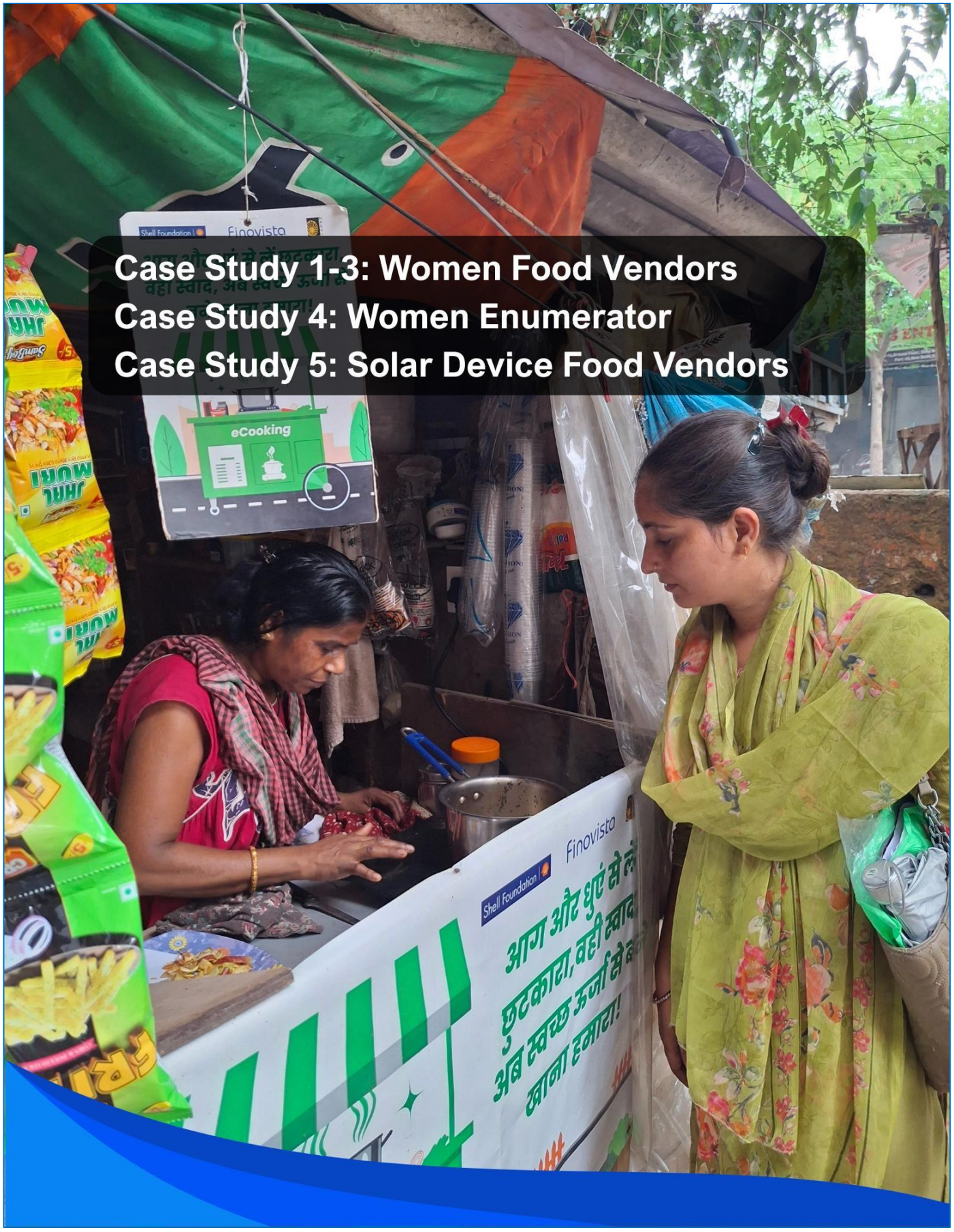
- Technology and supply chain development should factor heterogeneity of Indian food vendors. The pilot confirms that no single device type is suitable across cuisines, vessel sizes, or heat requirements. Vendors with limited customers and boiling based dishes 1.6–2.0 kW induction units suitable, while vendors cooking diverse foods and having requirements of shallow or deep fry found infrared and concave infrared cooktops compatible with their aluminium and round-bottom cookware. Higher-wattage devices have limited supply chain. A scale-up programme must adopt a device-portfolio approach: pre-classifying vendors by cuisine, cooking process and customer footfall and bundling devices with compatible cookware, and engaging multiple manufacturers across categories. After-sales service must be built into procurement, with regional and local service nodes to minimise downtime. Innovation financing should focus on commercial-grade, continuous-use devices.

- Embedding Electrical Readiness into the Scale-Up Pathway - The pilot shows that eCooking creates a productive-use load, unlocking a new, stable daytime revenue opportunity for Utilities; this positions food vendors as a commercially relevant customer segment whose adoption directly supports utility load growth and asset utilisation. However, many willing vendors were held back not by network availability but by documentation requirements that do not align with informal vending realities, limiting their ability to secure formal connections. Addressing this gap calls for coordinated utility–policy action to simplify and standardise documentation required by Food vendors. At the same time, vendor kitchens and cooking areas were never designed for high-wattage electric devices, leading to retro fitments, financed entirely by vendors. For scale, electrical readiness needs to be bundled into the eCooking offer through standardised upgrade kits. Further utilities have to play a pivotal role by facilitating connections, upgrading sanctioned loads, and ensuring that vendors have access to safe and adequate electrical infrastructure. Coordinated on-ground support from utilities will help in mitigating the challenges that arise from non-suitable connections for food vendors, and to support them to safely operate the eCooking technologies.

- Financing for scale-up must fund the entire eCooking technology, compatible cookware, and costs for retro fitment. The research highlights that total cost of adoption is driven by these combined elements. Prominent schemes such as PM-SVANidhi[13], MUDRA[14] and PMEGP[15] already reach this segment and can be further leveraged for small-ticket finance with convenient repayment cycle schedules linked to vendor cash flows. MFIs and NBFCs can serve as last-mile channels for credit, can also integrate warranties and servicing are included within financed packages. Demand aggregation at city or state level can materially reduce procurement costs, as evidenced by the mature supply chain for 1.6–2.2 kW devices. Carbon-finance, bulk procurement or pay-as-you-go models can further supplement the affordability, but not replace mainstream credit access.

- Engaging women and local partners across the value chain is essential for scale, given their role in the pilot. Women formed a majority of active operators across both locations, and institutions such as JEEViKA/WIRES, NASVI, community cooks, and local field teams enabled vendor mobilisation, training, and troubleshooting. Weekly site visits and FGDs were central to stabilising adoption patterns. Scaleup phase should integrate women vendors, Self Help Groups, and local federations as peer trainers, cluster monitors, and first-response troubleshooters. Leveraging partner organisations with strong community linkages must anchor behaviour-change work, support the learning curve, and maintain monitoring routines that feed real usage data into technology and finance decisions.

[13] https://www.pmsvanidhi.mohua.gov.in/
[14] https://www.mudra.org.in/
[15] https://www.kviconline.gov.in/pmegpeportal/pmegphome/index.jsp


Case Study 1-3: Women Food Vendors
Case Study 4: Women Enumerator
Case Study 5: Solar Device Food Vendors
eCooking
Finovista
Shell Foundation

CASE STUDY 01

PROFILE

Name: Ms. Sudha Bansiwar
Location: Madanpur Khadar, New Delhi

INTRODUCTION

Every morning, the aroma of freshly prepared Momo (Dumplings) filling fills the tiny 8x8 kitchen in Sudha's home, where she, her husband, and two sons work together to shape perfect dumplings. Her small Chinese food stall is the only source of income for the family, and each Dumplings they prepare carries their shared hope and hard work. Since adopting the electric cooking, Sudha's routine has transformed—she now steams Dumplings and prepares sauces side by side, all while working comfortably under a fan. The once smoky, exhausting mornings have become quick, clean, and effortless. With reduced LPG refills and more savings, Sudha now cooks with ease and confidence, serving warmth and flavor in every plate.

IMPACT METRICS

Reduction in LPG Refills
30 Cylinders
↓
15 Cylinders

LPG Cost reduction
₹ 18000
↓
₹ 9000

Electricity Bill Increase
₹ 400
↑
₹ Zero

Total Savings
₹7K per month

LPG Expense before eCooking

Earlier, Sudha used one 5 kg LPG cylinder daily at ₹600 per refill, spending nearly ₹18,000 a month. With the eCooking device, her fuel costs have reduced drastically, helping her cook faster, cleaner and save more.

Transition to eCooking

She has been using Concave Infrared cooktop, to steam dumplings and prepare sauces, while her husband cooks noodles at the stall. She conveniently uses her own aluminum dumpling maker and wok for daily cooking, making the transition smooth and effortless.

Income Impact

Earlier, Sudha sold around 80 plates per day. After adopting the eCooking device, faster cooking reduced waiting time and serve more customers. She is now able to sell about 100 plates daily, an increase of 20 plates. This rise in sales adds approximately ₹800 to her daily earnings.

"I can cook faster, serve more customers, and save money. This new device has truly changed my work and my day"

-Sudha Bansiwar

CASE STUDY 02

PROFILE

Name: Ms. Laxmi Devi
Location: Gaya, Bihar

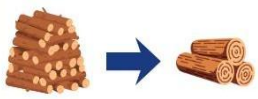
INTRODUCTION

For the past five years, Laxmi has started her days before sunrise, gently steaming idlis and simmering sambhar in her tiny kitchen, while her husband sets up their food cart just outside. It's a simple, familiar rhythm the two have leaned on every single day to keep their family going.

With the introduction of the infrared cooktop, her mornings have changed for the better. What once required long hours and left her exhausted from heat and smoke is now quicker, cleaner, and far more comfortable. She can steam idlis and boil sambhar efficiently, completing her work with ease. The new device has not only reduced her effort but has also brought a sense of comfort and relief to her daily routine.

IMPACT METRICS

Reduced Traditional Fuel Usage



Cost Reduction of Traditional Fuel
₹ 1200
₹ 300

Electricity Bill Increase
₹ 600
₹ 250

Total Savings
₹550 per month

LPG Expense before eCooking

Before switching to eCooking, Laxmi used firewood and cow dung cakes, spending nearly ₹1,200 a month on fuel. Buying cow dung cakes at ₹10 for 6 pieces strained her income, and the smoke and effort made cooking exhausting.

Transition to eCooking

She has been using an Infrared Cooktop with cookware and fully switched to electric cooking. Faster cooking lets her husband start vending earlier, increasing sales, and she can prepare extra idlis when needed to earn a little more.

Income Impact

Faster cooking allows her husband to start vending earlier, which directly increases their sales. She can also prepare extra idlis whenever required, helping them serve more customers and boost daily earnings. As a result, she now earns around ₹1,400 more every month, in addition to fuel savings of approximately ₹550, giving her a total monthly benefit of nearly ₹2,000.

"My kitchen is clean, my work is faster & my husband says customers are happier too. Now I can cook without any smoke and tears in my eyes"

- Laxmi Devi

CASE STUDY 03

PROFILE

Name: Ms. Sangeeta Kumari
Location: Madanpur Khadar, New Delhi

INTRODUCTION

In the quiet lanes of Amas village in Bihar, before the first light of dawn, Sangeeta begins her day. While many from her village migrate in search of work, she chose to stay back and build her own path. Her small food stall, run from her home, is the only source of income for her family. Each morning, she sets water to boil on her eCooking device, preparing steaming cups of tea for her early customers as she moves between her kitchen and household chores. The device has made her mornings smoother and faster, helping her open her stall right on time. For Sangeeta, every sunrise is more than just the start of a new day — it's a quiet testament to her strength and determination to keep her family's hopes alive.

IMPACT METRICS

Reduction in LPG Refills
3 Cylinder
↓
0 Cylinder

LPG Cost reduction
₹ 1500
↓
₹ Zero

Electricity Bill Increase
NO INCREASE

Total Savings
₹1500
per month

LPG Expense before eCooking

Sangeeta earlier used a 5 kg LPG cylinder, refilling it about three times a month at a cost of ₹1,500. Each cylinder lasted around ten days, and on some days she couldn't afford a refill, her stall had to remain closed.

Transition to eCooking

She has been using an Induction cooktop with a 5L kadai and 3L saucepan and now cooks entirely on electricity. With zero electricity bills under the Mukhya Mantri Vidyut Upbhokta Sahayata Yojana, she no longer worries about LPG shortages or closing her stall.

Income Impact

Earlier, whenever she **ran out of LPG**, her shop remained **closed for 2–3 days every month**, leading to loss of income. After receiving the eCooking device, she now operates without interruption and earns an additional **₹1,000–₹1,200 per month**. Along with fuel savings of around **₹1,500**, she now brings in nearly **₹2,700 extra every month.**

"The eCooking device made my work easier, cleaner, and more reliable—it changed how I run my stall."

- Sangeeta Kumari

CASE STUDY 04

Anju Devi – A CCC Didi Bridging Trust and Technology in Manpur

BACKGROUND

- Anju Devi is a trained Clean Cooking Champion (CCC Didi) in Manpur, Gaya Bihar.
- She had prior experience with induction cooktops through Jeevika.
- This pilot introduced her to infrared and concave infrared devices for the first time, strengthening her technical understanding and confidence.

Why Anju's Role Was Unique (Advantage as a Woman Enumerator & CCC Didi)

- Trusted Access to Kitchen Area
- Peer-Level Connection
- Cultural Comfort
- Strong SHG & Jeevika Linkages
- Consistent Field Presence
- Trust as a Local Woman

Contributions to the Pilot

- Surveys: 85–90 baseline surveys
- Mobilisation: 60+ vendors mobilised
- Demos: 6–8 group demonstrations
- Training: Device use & safety training
- Deployment: 40–45 device deployments
- Follow-ups: Bi-weekly support

Contribution to Pilot Outcomes

- Participation: 45–50 vendors reached (5–10% of total)
- Acceptance: Higher trust, reduced hesitation
- Clarity: Vendors understood device functions after her guidance
- Retention: Lower drop-outs through regular follow-ups

What She gained from the pilot

- Skills: Enhanced knowledge of infrared and concave IR devices; improved troubleshooting and communication abilities.
- Recognition: Trusted by 40+ vendors and widely consulted by SHG members for tech guidance.
- Income: Earned ₹3,000 per month for 3 months (₹9,000 total), boosting household income and motivation.

Anju Devi's role demonstrates how women CCC Didis bring empathy, cultural access, and trust that go beyond technical facilitation. Her presence helped households feel comfortable with eCooking, ensured smoother technology adoption, and strengthened community engagement. At the same time, the project helped her build new skills, confidence, and identity as a local clean-energy guide.

CASE STUDY 05

PROFILE

Name: Mr. Mantu Prashad
Location: Barachatti, Gaya, Bihar

INTRODUCTION

Mr. Mantu runs a fixed food stall in Sharma Bazar, Barachatti, Gaya, selling tea, coffee, pakoda, samosa, and kachori. He works 5–7 hours daily using high-flame cooking and depends on LPG (INR 1,000/month) and coal (INR 420/day). He supports 2 employees + 1 family member, serving around 50 customers/day and earning about INR 15,000/month. Although he has a 1 kW electricity connection, heavy fuel costs and smoke affected his work—leading to the deployment of a 2 kW off-grid solar system, Mantu gradually shifted to electric cooking. The system, supported by a reliable 5-hour backup, now powers his induction cooktop, lights, and fan, helping him run his stall more cleanly, smoothly, and consistently. Today, his mornings start with the quiet hum of the induction cooktop—no smoke, no soot—just a clean, reliable way to serve his customers.

Transition to eCooking

Mantu now uses an induction cooktop for 3 hours daily, powered through his solar system. The device supports all his key operations—tea boiling, frying, sautéing, and preparing snacks.

The solar system (2 kW with 4 batteries and inverter) has completely removed the fear of electricity cuts. His stall remains smoke-free, food is prepared faster, and customers prefer the cleaner setup.

IMPACT METRICS

Reduced Traditional Fuel Usage
30 kg ↓ 15 kg

Cost Reduction of Traditional Fuel
₹ 12600 ↓ ₹ 6300

LPG Refills
1 Cylinder ↓ NO CHANGE

Electricity Bill Increase
NO INCREASE

Total Savings
₹6300 per month

Solar System Configuration
Solar Capacity: 2 kW off-grid system
Battery: 5-hr backup, 150 Ah (×4 units) With Inverter
eCooking Device: AC induction cooktop (2,000 W)

Solar Energy Performance
Total Solar Energy Generated: 246 units (2 months)
Daily Generation Range: 0.83 – 7.17 units/day
Average Daily Generation: 4.8 units/day
Daily Usage: 3 hours/day for cooktop, table fan, LED lights

Business Quality & Adaptation
Savings allow purchase of better ingredients
Strong shift to electric cooking
Fully adapted to solar + induction cooking

Income Impact

Earlier, most of his profit was lost to coal expenses. After shifting to solar-powered eCooking, Mantu now saves ₹6,300 every month on fuel. The cleaner, smoke-free stall has improved customer experience, and uninterrupted cooking allows him to prepare more items on time—helping him earn ₹1,000–₹2,000 extra per month even without any increase in footfall. Overall, his total monthly gain is now around ₹7,500 (fuel savings + income rise).

"Solar has reduced the smoke significantly. Work has become easier and cheaper too."
- Mantu Prashad