WISIONS of sustainability

Factsheet Series:
Sustainability Solutions for Mountain People and Landscapes

Electric Cooking for Micro Enterprises in Nepal

A woman entrepreneur uses an induction-compatible kadhai (wok) in her kitchen
(Photo: PEEDA, 2025)

Introduction

Nepal is in a unique position where 100% of electricity generation is renewable, yet 64% of domestic energy use is from burning biomass and waste.[1] Over the past three decades, Nepal has made remarkable progress in electrification. With more than 1,800 community-managed micro-hydropower plants (MHPs),[2] 95% of households have electricity access.[3] Despite this development, cooking practices remain largely unchanged. Less than 1% of the population uses electric cooking (e-cooking) technologies.[4] E-cooking offers a cleaner, cheaper, and more efficient alternative to Liquid Petroleum Gas (LPG) and firewood.[5] By using locally generated electricity, households and enterprises can reduce operating expenses, improve working conditions and strengthen business productivity. At the same time, increased electricity demand helps to financially stabilize MHPs and supports Nepal's Nationally Determined Contribution (NDC 3.0), which prioritizes e-cooking adoption as part of the clean energy transition.[6]

To explore the potential of e-cooking beyond the household level, an area on which most initiatives have focused thus far, this factsheet draws on the findings of a field-based study of small tea shops, restaurants, and hotels in rural Nepal. Intended for practitioners, local governments and development actors, it provides practical insights into opportunities, challenges and enabling conditions for commercial adoption of e-cooking.

The surveyed enterprises typically served fewer than 50 customers per day and were run by one or two family members, often combining business and household cooking in the same kitchen. The most frequently prepared dishes were chowmein, momos, dal bhat tarkari, and tea, reflecting common cooking practices and energy needs in rural commercial settings.

The findings highlight the practical relevance of e-cooking at the micro-enterprise level, and the need for targeted approaches that address commercial cooking needs within broader energy transition efforts.

Restaurant owners in Badigad learn about the features and operation of induction stoves during a live cooking demonstration (Photo: PEEDA, 2025)

The Solution Tested

Under the WISIONS Innovation Lab Nepal, this study tested an electric cooking solution tailored to the needs of rural micro and small enterprises, including tea shops, restaurants and small hotels in Badigad and Nisikhola rural municipalities of Baglung district. 20 businesses participated which were provided with 2kW induction cookstoves, along with induction-compatible cookware such as pressure cookers, frying pans, and momo steamers. The provided cookware varied, depending on the needs expressed by the businesses and team observations during the survey. When required – which was the case in 70% of the participants – internal wiring and miniature circuit breaker (MCB) upgrades were carried out to ensure sufficient load capacity and safe operation.

Key Insights

The study has revealed key findings that can be used to support future work.

- **Peer learning and live demonstrations are powerful drivers of adoption.** Over 80% of enterprises were initially unfamiliar with e-cooking. Seeing the technology in use by peers proved essential to building confidence and overcoming initial hesitation.
- **The rate of e-cooking adoption depends largely on the menu and cooking methods.** Boiling, pressure cooking and tea preparation shifted largely to electricity, while frying and roasting (especially chowmein) remained LPG-based due to the unavailability of induction-compatible cookware suitable for these cooking practices.
- **Electricity reliability limits full transition, but partial adoption already creates substantial benefits.** The most frequently cited barrier in the endline survey was unreliable power supply, highlighting the need for improvements to the grid and supply. Despite this, enterprises still shifted a large share of their cooking to electricity, showing that economic and operational benefits can be achieved even before full reliability of the electricity service is ensured.
- **Limited market availability of induction stoves and suitable cookware restricts commercial use.** Induction stoves and compatible, large-capacity cookware were very scarce in local markets, indicating a generally weak supply chain and low local demand for induction appliances at the time. Due to the limited supply, businesses had to settle for smaller, less suitable equipment for commercial cooking.
- **Lack of local repair services affects user confidence.** The absence of trained technicians and readily available spare parts for induction appliances or electric pressure cookers poses a risk to long-term adoption of e-cooking in rural areas.
- **Upfront investment costs remain a barrier for micro-enterprises.** High initial costs require supportive financing mechanisms such as targeted subsidies, soft loans, or lease-to-own models.

Restaurant owners in Badigad use induction stoves in their kitchens to prepare scrambled eggs and momo (Photos: PEEDA, 2025)

Financial Viability Despite High Upfront Costs

The transition to e-cooking using induction stoves is slightly complicated by the fact that provided induction hobs are only compatible with ferromagnetic cookware. As a result, total appliance and replacement cookware costs for the study ranged from NPR 7,600 – NPR 15,840. The variation was dependent on the enterprise size and the menu they offered.

E-cooking's upfront costs (CapEx), however, did result in a significant drop in operational expenditure (OpEx). LPG is more expensive than electricity per kWh in Nepal, so swapping LPG cooking actions with e-cooking results in cost savings. This is bolstered by the fact that induction stoves are much more energy efficient than LPG or firewood stoves. In short, both the quantity of LPG/firewood used and cost per serving dishes decreased for businesses.

The particular case of three of the participant microenterprises are presented below in more detail. They illustrate low, medium and high e-cooking adoption, depending on the percentage of cooking activities switched to e-cooking. All three kitchens showed a significant reduction in LPG consumption, and the total savings in fuel costs can be seen in the table below. A clear relationship between induction usage rates and speed of the payback period was observed. Higher induction usage leads to substantially shorter payback periods, ranging from about 10–12 months for high and medium users to over three years for the low-usage case.

Case Study Micro Enterprises	CapEx (NPR)	Baseline Monthly OpEx (NPR)	Monthly OpEx after switching to e-cooking (NPR)	% OpEx reduction	Payback Period (months)
High Usage (86%)	15,650	4,000	2,450	39	10
Medium Usage (65%)	9,700	2,000	1,180	41	12
Low Usage (36%)	15,840	1,500	1,127	25	42

Socio-Economic and Environmental Impacts

Beyond the financial benefits, there were a host of associated advantages to adopting e-cooking technology that micro enterprises benefitted from but also on a broader local and national level.

Micro-Enterprise Impacts

There were noticeable improvements to workers' daily working conditions. Participants widely praised e-cooking for creating safer, cleaner and more comfortable kitchen environments. Over 85% of enterprises considered induction stoves safer than LPG or firewood, citing the absence of open flames, gas leaks or smoke. Nearly all participants highlighted the ease of operation as a major improvement over the constant handling of gas cylinders or damp firewood.
The switch to electricity also eliminated smoke and soot, resulting in cleaner walls, utensils and air quality, which improved comfort for both cooks and customers. None of the participants reported any electrical or fire-related incidents during the study, helping to dispel earlier fears around using electricity for cooking. Collectively, these experiences reinforced the perception that e-cooking is not only efficient and economical but also a safer and healthier alternative for small businesses. By the end of the study, none of the participating enterprises wished to give up their e-cooking equipment or return to fully LPG-based cooking, reflecting a strong sense of satisfaction with the technology.

Empowering small businesses with clean cooking technology
(Photo: WISIONS, 2025)

Hands-on learning: micro enterprises adopting electric cooking solutions
(Photo: WISIONS, 2025)

Regional and National Impacts

With no natural gas or oil reserves of its own, Nepal imports all its fossil fuel energy. This has resulted in a large trade deficit and leaves Nepalese consumers subject to volatile prices and supply. This was exemplified in the 2015 border blockade crisis, where LPG imports from India, Nepal's biggest supplier, were severely restricted. This resulted in a national shortage, tripling the cost of oil and triggering the closure of factories, businesses and schools. Exacerbating the results of the 2015 earthquake, 3 million children were put at risk of death and disease[7]. Within this intervention LPG usage frequency dropped by 63%, as enterprises switched to locally sourced renewable electricity. Expanding the transition from LPG to electricity would thus improve Nepal's energy resilience on a national scale.
There is mutual benefit for increasing demand on MHPs which are currently operating at low load factors of around 20%[8]. This means that a lot of the energy generated is being wasted and not sold, impacting the financial viability of these plants and resulting in reduced funds for repair and upkeep. The electrification of the cooking sector would support the renewable generation infrastructure whilst simultaneously providing cost savings and price stability for enterprises.
Nepal's NDC highlights the transition to e-cooking as a key target to reduce national emissions, aiming to have '15,000 institutions and firms' using e-cooking by 2035 [6]. Commercial and residential cooking and heating account for around 10% of national emissions [1] which largely depend on polluting fossil and biomass fuels, mostly firewood. The transition to e-cooking will assist in reducing direct emissions from these sectors, decreasing deforestation and indirectly reducing transport emissions as less LPG is required to be imported.

Scaling Up and the Way Forward

The Baglung pilot confirmed that e-cooking is technically feasible once the required infrastructure has been installed, and that it is beneficial for and popular with rural micro enterprises once introduced. A majority of cooking activities were successfully transitioned to e-cooking, resulting in significant reductions in LPG use and improved kitchen conditions. Future interventions should focus on the following priorities to expand on this work:

1. Demonstration and peer learning

Practical demonstrations and peer exchanges were decisive in overcoming hesitation. Future programs should prioritize these activities as core components to build confidence and accelerate uptake.

2. Customisation is necessary

Appliance packages must reflect the cooking needs and practices of micro enterprises. Rising awareness about and promoting induction stoves is not enough. Potential users should also be able to select and invest in suitable cookware, i.e. utensils that are compatible with both a) the induction stoves and b) the regular cooking practices in their micro enterprises.

3. Infrastructure upgrades unlock potential

Wiring upgrades and circuit protection must be planned beforehand as standard elements of any intervention. Reliable infrastructure is an enabler, not a barrier, for productive use of electricity.

4. Local supply chains must be strengthened

Networks must be built for induction stoves, induction-compatible cookware, spare parts and repair services. Technical training for local technicians is essential to sustain adoption. Policy integration is critical.

5. Affordability ensures inclusion

Beyond subsidies, future initiatives should explore financial models such as soft loans, lease-to-own schemes, or targeted subsidies to make appliances accessible to micro enterprises with tight margins.

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This QR Code guides you to the full report: *https://www.wisions.net/wp-content/uploads/2025/11/WISIONS-Reports_IL-Nepal_E-Cooking.pdf*

This QR Code guides you to a video showing the implementation of this e-cooking intervention: *https://www.youtube.com/watch?v=_gX1C8jti_g*

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This factsheet is part of the series "Sustainability Solutions for Mountain People and Landscapes," developed within the WISIONS Innovation Lab Nepal. The aim is to promote an integrated approach to strengthening the livelihoods of people living in mountain communities. Each factsheet provides information on specific sustainability solutions in the fields of energy and landscape management that have shown promising potential for improving the livelihoods of mountain people but have a low level of adoption in Nepal and other mountain regions. The information is tailored to the specific context of Nepal's mountain landscapes and offers practical insights and guidance for scaling up the application of these solutions. Additionally, it presents an integrated approach that begins with an understanding of the opportunities and challenges faced by mountain communities, enabling the systematic deployment of synergies between solutions from the energy and landscape sectors.

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