

Market-led Promotion of Electric Stoves

Experiences from a Demonstration Project in a Community Rural Electrification Area



Innovation for sustained growth

Ajummary Bikas Foundation

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Foreword

The Market-led Promotion of Electric Stoves demonstration project was initiated by Ajummary Bikas Foundation (ABF) and National Association of Community Electricity Users-Nepal (NACEUN) since November 2017. A community rural electrification entity (CREE) in Dewabhumi Baluwa of Kavrepalanchok district, also a member of NACEUN, is the local partner in this project.

This project was initiated to see if electric cooking could be feasible in community electrification areas as a clean cooking solution. We were particularly interested in gaining insights on social acceptance of electric cooking, its comparative economic benefits, potential challenges and suitability of community rural electrification entities as institutional vehicles. This project is funded by internal resources of ABF and NACEUN, and is the first of its kind in electric cooking sector of Nepal. The Government's announcement to pursue 'electric stoves in all households' through the 2018 White Paper has motivated us further. We believe that the White Paper validates the relevance of the demonstration project.

This booklet presents experience from the demonstration project, which is basically affirmative, and has driven ABF and NACEUN to launch a larger campaign of electric cooking promotion in all CREEs starting from 2019. We believe this booklet provides valuable insights to all concerned agencies involved in promoting electric cooking.

I take this opportunity to thank every individual and institution, who has extended moral and physical support in making this demonstration project a success.

Subarna Prasad Kapali
Managing Director
Ajummary Bikas Foundation

Contents

Context	1
Project Overview	2
Conceptual framework	3
Implementing Actors	4
Timeline of the project	5
Activities	6
Thrust 1: Promotion and demand creation	6
Thrust 2: Accessibility- Market system development	7
Thrust 3: Enabling Environment	8
Thrust 4: User education	9
CREE readiness	10
Benefits – emerging impacts	11
Lesson learned	13
Challenges	15
Upscaling potential	16

Context

In Nepal, more than 61 per cent of the total population still relies on firewood for cooking (CBS 2016). Diseases attributable to household air pollution resulting from the use of solid fuels claim more than 21000 lives each year in Nepal (IHME 2016). In response to that, Nepal government has set a goal to achieve clean cooking solutions for all (CCS4All), by 2022. Similarly, ensuring universal access to clean cooking fuel by 2030 is one of the complementary targets of the Sustainable Development Goal 7 – Affordable and Clean Energy.

Electricity access in Nepal has improved significantly in the recent years, which is an important opportunity for the promotion of electric cooking as a clean cooking solution. The 2018 White Paper released by the Ministry of Energy, Water Resources and Irrigation, recognizes electricity as an obvious alternative to traditional and imported cooking fuels. Supply chain system of electric cooking however, has not developed yet in much of Nepal. Many rural households are simply unaware about multitude options that are available in the market. As a result, even the population that has access to electricity and financing capital/services are bound to rely on firewood.

While awareness and supply chain system are necessary for increasing initial adoption of electric cooktops, emerging evidence suggests that initial adoption alone is not adequate to realize the benefits of clean cooking. Equally important are their sustained and correct use, and the rejection of inefficient technologies. Without a complete transition, the government's vision of 'clean cooking solutions for all by 2022' and 'electric stoves in all households' may not be realized. Therefore, Ajummary Bikas Foundation (ABF) and National Association of Community Electricity Users-Nepal (NACEUN) initiated the 'Market-led Promotion of Electric Stoves' demonstration project since November 2017.

Project overview

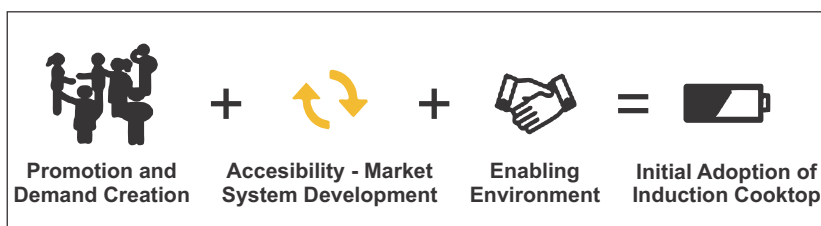
The Market-led Promotion of Electric Stoves demonstration project was conducted in Dewabhumi Baluwa (Kaskote), a village located in Panchkhal Municipality of Kavrepalanchok district, Nepal. The village community has access to grid electricity managed by a community rural electrification entity (CREE) called Samudayik Gramin Bidhyutikaran Upabhokta Samiti, which operates under the policy framework of Nepal Electricity Authority. According to the 2011 Census, the village (previously a Village Development Committee) had a total of 1578 households, of which over 93 per cent had access to electricity. Nevertheless, less than 20 per cent of the households uses clean fuel (mainly biogas and LPG), and firewood remains a dominant fuel for cooking.

The demonstration project uses a holistic approach to ensure smooth transition of firewood and LPG-using population to electric cooking technologies users – it involves not only creating demand and improving accessibility of electric stoves in community rural electrification areas, but also, ensuring mechanism to deliver user education, (cooking) behavior monitoring and, repair and maintenance services. The primary objective of the project was to support CREE members to transition from traditional fuel and technologies to electric cooking solutions through a sustainable, market-led approach.

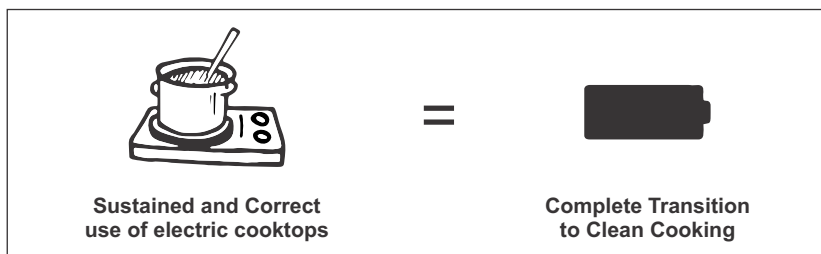
Conceptual framework

The demonstration project was designed to increase access, adoption and to ensure sustained use of electric cooktops. The thrust was not only to present electric cooking as a clean cooking alternative and to see people adopt it, but more importantly to see them transition toward clean cooking behavior. Hence, the conceptual framework of the demonstration project has two major components: a) increasing access, and b) increasing use as illustrated below.

Increasing access



Increasing use



Implementing actors

Ajummary Bikas Foundation (ABF) and National Association of Community Electricity Users Nepal (NACEUN) initiated this project, and are the key implementers. Community Rural Electricity Users Committee – Baluwa is the local partner for this project.



Ajummary Bikas Foundation

- Concept design for promotion and demand creation
- Market research
- Supply chain development for electric cooktops
- Ensure correct and sustained use of electric cooktops

National Association of Community Electricity Users Nepal

- Feasibility assessment for the promotion of electric cooking in the CREE
- Multi-tier coordination
- Technical monitoring

Samudayik Gramin Bidhyutikaran Upabhokta Samiti (Baluwa CREE, Kaskote)

- Promote and create demand for electric cooking among its members
- Local coordination
- Technical monitoring

Timeline of the project

November 2017

Concept design for the pilot project
Planning and coordination

February 2018

Rapid Assessment of the CREE's need for and interest in the project
Live cooking demonstration
Baseline study of the existing fuel use scenario

March 2018

First electric stove sales event (10 sold)

May 2018

Second electric stove sales event (8 sold)
User Education for new adopters

August 2018

User feedback collection
Linkages established between interested EC buyers and local retailer

September 2018

A group of 7 users purchased electric stoves from a supplier promoted in Panchkhal (under CCA support)
User education visit

January 2019

Baluwa pilot project - Phase II is expected to start

Activities

Thrust 1: Promotion and demand creation

Activity Details	Output
1. Before entering the community, CREE staffs were sensitized at CREE office on the need for clean cooking solutions and the benefits of electric cooking to the CREE and to its members	<ul style="list-style-type: none">• CREE's willingness to participate in the project
2. Market research	<ul style="list-style-type: none">• Good quality products identified, to be promoted in the project site
3. Mass demonstrations to raise awareness among CREE members: <ul style="list-style-type: none">• Familiarized CREE members with the product through live cooking demonstration• Information about cost and benefit of clean cooking, product options, quality, use, maintenance and safety was disseminated	<ul style="list-style-type: none">• Improved awareness among CREE members about electric cooking options• Increased interest among CREE members in electric cooking options
4. Baseline study of fuel use behavior of interested potential consumers	<ul style="list-style-type: none">• Existing fuel use scenario assessed
5. CREE technicians were trained on marketing approaches, and involved in raising awareness across larger CREE community.	<ul style="list-style-type: none">• 25 demands for electric cooktops collected by a CREE technician

Baseline study

Baseline study suggested that biogas, LPG and firewood are common fuel types in the area. Participants were made to use Likert scale to indicate their preference for different stove attributes. The result suggests that 'safety'; 'time-saving' and 'durability' are the most preferred stove attributes among Baluwa residents.



Mass demonstration

Mass demonstration comprised of two main sessions: i) a session on the importance of clean cooking for socioeconomic and environmental benefits of the society ii) a live cooking demonstration where participants were allowed to use and feel the product for themselves.






Thrust 2: Accessibility-Market system development

Activity Details	Output
1. Product bundling i.e. bundling of electric cooktop with induction-based mandatory cooking utensils, to suit the needs of the local peopleMarket research	• Product package developed for promotion
2. Electric stoves were made available in Baluwa for the first two batches of early adopters by ABF. ABF delivered the product demanded by CREE members in Baluwa until the local availability of the electric cooktops was ensured.	• 18 electric stoves supplied to early adopters among the CREE members

- | | |
|---|---|
| <p>3. Meetings with city-based large distributors of electric stoves to collectively identify best channels to cost-effectively supply electric stoves to Baluwa CREE community</p> | <ul style="list-style-type: none"> Local availability of electric stoves in Baluwa at competitive price ensured |
| <p>4. A link was established between the CREE community (potential buyers of electric stoves) and the local retailer of quality products.</p> | <ul style="list-style-type: none"> Local availability of good quality electric cooktop ensured |
| <p>5. Recognition of local retailer by the city-based distributor obtained to ensure eligibility of its clients for warranted services</p> | <ul style="list-style-type: none"> Repair and maintenance services were guaranteed for the clients of the local retailer |

Supply chain actors

For market system development, several rounds of meetings and negotiations were done to get a large distributor and a local retailer on board in this project.

 <p>Large Distributor</p> <ul style="list-style-type: none"> - Consistent supply of quality products - After-sales-service - Support in promotional activities 	 <p>Local Retailer & Service Providers</p> <ul style="list-style-type: none"> - Consistent supply of quality products and service - Quality consumer service - Consumer education 	 <p>Local Consumers</p> <ul style="list-style-type: none"> - Initial adoption of electric cooktop - Quality consumer service - Correct and sustained use of electric cooktop 	<p>Supply Chain Actor & Their Roles</p>
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A local retailer (affiliated to ABF) of electric cooktop was developed as a part of Behavior Change Campaign supported by Clean Cooking Alliance.

Thrust 3: Enabling environment

Consumer financing

Households who are unable to pay the upfront cost of the product have been linked with local financing institution with the provision of

consumer-financing services. The service has allowed interested buyers from low-income groups to complete their payment of electric stoves in three installments. Others have been paying the upfront cost out of their pocket to procure the product package.

Installment payment allowed us to purchase the stove when we wanted to. If it (the service) were not available, we would probably still purchase the stove but may be later.

-Juna Danuwar, Baskote

Technical support and monitoring by CREE technicians

CREE technicians have been making CREE beneficiaries aware about the basic wiring, MCB requirements, electric stove use and safety-related information. They also help local electricity users to set up their electronic devices at home and provide basic repair and maintenance services.

“So far, increased number of induction stove users has not affected the local distribution system as the number has not increased by much. If the number keeps rising, we may have to increase the number of load centers and transformers' capacity.

Voltage goes down for consumers living beyond one kilometer from the load center. Some of the buyers of induction cooktop are from such areas, so they have not been able to use the stove yet.”

- Hari Chandra Shrestha, Baluwa CREE Technician

Thrust 4: User education

Activity Details	Output
1. Household visits were conducted to educate users on the correct and safe use, and maintenance of electric cooktop.	<ul style="list-style-type: none"> • Correct and sustained use could be ensured.
2. Users feedback collection	<ul style="list-style-type: none"> • Understanding of people's perception about the product.

Shova Dhital (Kaskote),

user since March 2018

Before user education: “My mother-in-law was at the event where they taught how to use the stove. But at home, I cook meals and use stoves all the time. I did not know how to use Induction stove. My husband taught me how to turn it on. On one of the initial days, I put rice on the stove, turned it on and went to another room for few minutes to get something. By the time I was back, I could already smell the rice burning. I stopped using the stove thereafter.”



After user education: “Uncle (*Hari Chandra Shrestha, CREE technician*) visited us with other miss and sir (*ABF staffs*);checked what went wrong. They said we were using too much power, and taught us how to adjust the power in the stove. After that, we have been using it regularly to cook meals. Uncle had told us to use a better plug, but we did not do it. Last month one of the plug pins came off.”

CREE readiness

Baluwa CREE is a local supplier of the 'fuel' i.e. electricity, for electric cooking in the area. Efficient and increased consumption of electricity is in the best interest of the CREE (for its economic sustainability) and its members (for health and socioeconomic benefits).

CREE technicians, as a part of the community, are well positioned to provide technical support to the project households in their transition to electric cooking.



Importantly, CREE has a strong social network within the community that the project taps in to:

- Disseminate knowledge about the benefits of clean cooking behavior, and
- Create demand for electric cooking in the area.

Benefits – emerging impacts

Twenty-five households have already purchased the stove - 18 induction stoves were supplied directly to the buyers by ABF, and seven households (latest batch) bought the stove at the local retailer in Tamaghat, Panchkhal.

Of the ones who are using the stove, majority have suggested that cooking on electric stove is easier, cheaper, safer and less time-consuming. About three of the adopters gave away their sets to their children living in Kathmandu, as they felt their children would benefit more from this quicker and easier way of cooking meals.

Bikas Lama (Kaskote), user since September 2018

“I have LPG stove, biogas, and induction cooktop in my kitchen. I cook rice, dal, tea on a regular basis on induction cooktop. We can also cook *sel roti* and *dheedo* on it, but have to mix the flour really well before cooking them on the stove. It does not taste as good as when cooked on fire though. I cook curry on biogas. I use LPG when I have to cook multiple dishes at one time.

Induction stove is so safe that I can put my hands on the space around the utensil while the power is still on.” *(As he speaks, he puts his palm on the stove while it is turned on and the dal is cooking).*



“I have not been to the forest to collect firewood since I started using it (induction cooktop). It looks safe so I have been allowing my daughter to make tea on it.”

-Maya Shrestha (Kaskote), user since March 2018

Prior to adopting the electric cooktop, Maya used firewood and LPG to cook her daily meals. She does not allow her daughter to use LPG and traditional stove because of safety concern.

Hari Chandra Shrestha (Baskote), user since May 2018 – also a CREE Technician

Hari Chandra Shrestha has a family of four. Prior to adopting an induction cooktop, he used LPG and biogas stoves as his primary cookstoves. After bringing home an Induction cooktop, he does not use LPG very often.

He says a cylinder of LPG (costs Rs. 1500 in the local market) lasts three months for his family, costing him around Rs. 500 per month. On the other hand, his family consumes about a unit (1 kWh) of electricity for cooking everyday using electric cooktop. At the rate of NRs. 12 per unit, he spends about NRs. 360 more for using induction cooktop for cooking on a regular basis (Rs 90 per person per month). He cooks rice, dal and tea on Induction cooktop while uses biogas to cook curry. He feels that compared to expenditure on LPG, he has saved about 28% per month while using electricity.



Efficient use of electricity has been ensured and CREE's revenue, although by a small margin, has also increased.

Lesson learned

- **CREE can be an institutional vehicle to promote electric cooking in rural electrification areas**

Baluwa CREE's existing social network has been pivotal in raising awareness about and creating demand for electric cooktops among CREE members. As it works closely with its beneficiaries (electricity users in the area), interpersonal communications, technical monitoring and mentoring could be pursued more efficiently.

- **CREE is capable of providing technical support to rural electrification areas**

Baluwa CREE has two technicians who are trained to fix or address any technical issues that may arise in the local distribution system. They are community members and are available in the area to provide technical support and guidance to the new adopters regarding wiring needs, correct use, safety and load management at household levels.

- **User education and behavior monitoring are important for ensuring complete conversion to electric cooking**

User education and behavior monitoring for the primary cook of the house are key to ensuring sustained and correct use of new cooking technologies. Without proper user education and mentoring support, it is easier for new adopters to give up using the technology.

- **Consumer financing is important to expand the accessibility of low-income households to electric cooking**

Installment payment made possible through consumer financing by a Local Financing Institution (Co-operative) has been an important scheme for those who are unable to pay upfront cost



of the electric cooktop in cash. Nine out of twenty-five households used this service to procure the technology. The need for subsidy has not been felt.

- **We had a better understanding of the issues associated with the product and cooking behavior of the people**

Some of the problems observed in the products could not have been known without their long-term usage. For instance, the induction base of a utensil, if is not in-built, may come off after a while of a regular use. It is more likely to happen if the utensil is used on multiple types of cookstove. This kind of experience is valuable in improving the product bundle and for the development of correct use guidelines for new electric cooktop users.

- **Local availability of repair and maintenance services is important**

Larger distributor has incorporated the local retailer into its network to ensure its eligibility for warranty and repair and maintenance services. However, people were found unwilling to go to the local market for minor repair and maintenance as the alternative (firewood and LPG) are readily available. Building capacity of CREE technicians to handle minor issues with the electric cooktop may be an important alternative to encourage sustained use of the technology in the community.

- **There is the need for more strong and scientific evidence to prove the cost-competitiveness of electric cooktops.**

Many among the adopters, still seem to be skeptic about the cost-effectiveness of electric cooktop. Therefore, cost reduction in electricity bill may be an important tool to create evidence of its cost-effectiveness and also to encourage the use of induction cooktop for new adopters.

Challenges

- **There is little knowledge among potential users about product quality, options, cost-benefit, and, safety related to electric cooktops.**

Electric cooking as a clean cooking option is a new idea for many in CREE areas, including Baluwa. Incorrect use of electric cooking, its poor performance as a result of incorrect use, and the resultant (negative) attitude of the early adopters toward the new technology (electric cooktop) can largely influence its rate of adoption in the coming days. Therefore, awareness about the importance of quality products and user education for its correct use and maintenance, should be given due importance during its promotion.

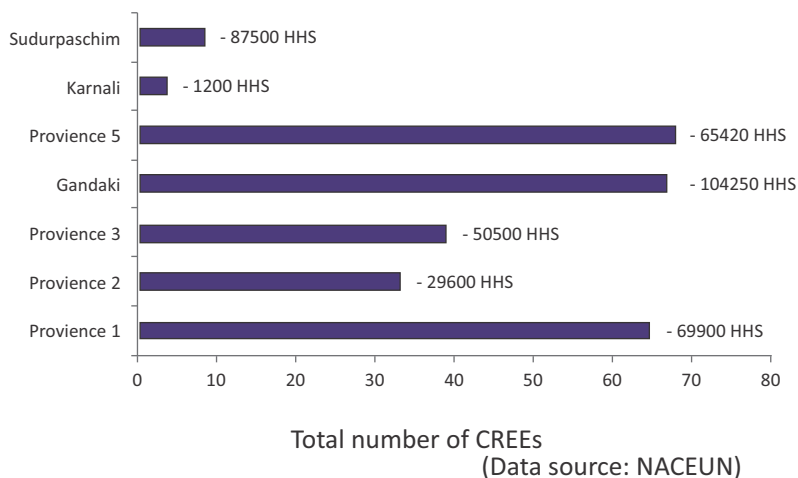
- **Although a significant amount of power available to CREE is currently underutilized, promotion of electric cooktop should be accompanied with the improvement in the current systems.**

Little is known at CREE as well as NEA levels about the possible impact that increased electricity consumption may have on the existing infrastructures. Therefore, close inspection of electricity consumption and transformer load status is crucial in the areas where electric cooktops are being promoted. CREE, as they work closely with their beneficiaries, are well positioned for performing these activities.

- **Fund limitation emerged as important hurdle for ABF and NACEUN to further intensify promotional activities in larger Baluwa CREE community, and to give continuation to user education and behavior monitoring efforts.**

Upscaling potential

There are over 283 CREEs spread across 52 districts of Nepal, supplying electricity to over 500,000 households. With increasing reliability of electricity in CREE areas and their downward accountability toward their beneficiaries, promotion of electric cooktops in their service areas can potentially be more effective, efficient and manageable.



About ABF

Ajummery Bikas Foundation (ABF) is a private company established in 2013 by a group of professionals with over two decades of experience in the renewable energy sector. The company specialises in project development, implementation, monitoring and evaluation, primarily around energy, environment, climate change, socio-economy, livelihoods and, gender and social inclusion.

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About NACEUN

National Association of Community Electricity Users-Nepal, (NACEUN) is a national federation of Community Rural Electricity Entities (CREEs), established in 2005. It has a total of 283 members (CREEs) from 52 districts of Nepal. NACEUN works as a united platform and provides services ranging from institutional strengthening, capacity development (of community electricity user's organizations), awareness creation, research, business development and fund raising for rural electrification development in Nepal.

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