

BEHAVIORAL INTERVENTION NOTE

**GREENER LIVING STARTS
WITH CLEANER COOKING:**
FOSTERING ENERGY-EFFICIENT
COOKING PRACTICES IN
PERI-URBAN COMMUNITIES
IN RWANDA¹

April 2024



I. MOTIVATION

Shifting behaviors towards more energy-efficient cooking practices is critical for a complete transition to clean cooking. In Rwanda, where nearly all households cook with carbon-intensive biomass fuels², World Bank teams designed and tested an intervention informed by behavioral science to introduce energy-efficient cooking practices.

In Rwanda, 99.6% of households cooked using biomass fuels, like firewood and charcoal in 2016.

Traditional cookstoves that burn solid fuels like firewood and charcoal are used by over 2.3 billion people globally, causing acute chronic illnesses and contributing to climate change through high levels of carbon emissions³. The problem is particularly significant in Rwanda, where 99.6% of households in 2016 cooked using biomass⁴. Thus, cooking alone contributes to 14% of greenhouse gas emissions in the local energy sector⁵. The government of Rwanda is actively working to reduce the use of biomass for cooking by increasing clean cookstove distribution to 80% of the rural population and 50% of the urban population by 2030⁶.

In addition to increasing access, shifting cooking practices and habits to better align with clean cookstoves is fundamental for a complete transition. Cooking practices evolve due to various historical, cultural, practical, and economic factors, which may lead to the continued use of traditional biomass cookstoves despite owning a clean one. Some cooking practices, such as slow cooking, are considered incompatible with clean or improved cookstoves, inhibiting a complete transition.

II. DIAGNOSTICS

In 2019 and 2020, the World Bank team conducted a diagnostics study to understand the roadblocks to the uptake and sustained use of clean cooking practices⁷. The research included thorough interviews and focus groups with households who owned and did not own clean cookstoves, a data analysis of the 2018 Multi-Tier Framework (MTF) survey⁸, and a review of relevant literature.

The analysis revealed a pattern of using multiple stove technologies and fuels to meet daily cooking needs. This *stove stacking* behavior was identified as a critical barrier to realizing a complete transition to sustained use of Improved Cookstoves (ICS). Furthermore, findings suggest that an underlying set of cooking traditions, especially norms about how staple foods like beans should be slow cooked on traditional stoves, drive stove stacking behavior and shape the perception that ICS are primarily suitable for fast cooking tasks such as heating porridge. As a result, many households still use traditional stoves for slow-cooking foods like dried beans.



III. SOLUTION DESIGN

Beans are a staple ingredient in Rwandan cuisine, and the country has the highest per capita bean consumption globally at 164 grams daily⁹. Beans are commonly prepared following a slow cooking method for several hours on traditional stoves. The World Bank team launched a behavior change intervention to improve the energy efficiency of traditional bean slow-cooking practices by emphasizing the soaking of beans before cooking.

A solution was developed to promote energy-efficient cooking practices in participating villages. The solution comprised delivering community-based training and distributing interactive calendars to aid at home with repetition over time. The diagnostic research informed the development of the intervention, and several alternative levers were tested on a smaller scale to assess their appropriateness, relevance, and feasibility. Finally, the intervention was refined to include four Key Design Elements presented on the next page.

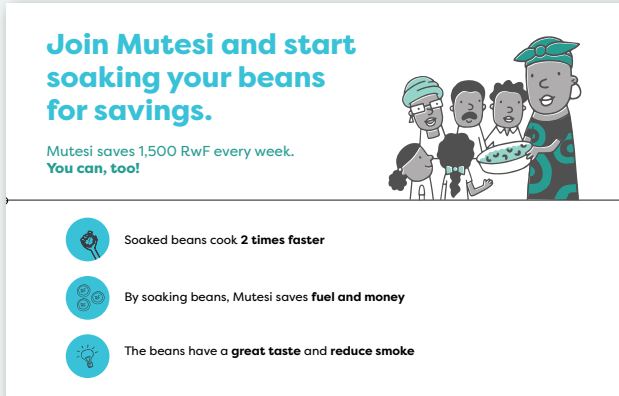
IV. IMPLEMENTATION

Trainers delivered the intervention in March and April 2023 through a 2-hour session to almost 1,400 participants in 200 villages across three Kigali districts, focusing on areas with a high concentration of charcoal users. An additional 1,400 participants from another 200 villages were randomly selected as a control group to contrast the results after the delivered sessions.

A survey was collected three months before and two months after the sessions to assess the impact of the intervention on attitudes about energy efficient cooking practices, cook time, fuel consumption and expenditure, and demand and ownership of clean cookstoves, among other outcomes. Additional demographic and socio-economic information of participants was collected.

01

BOTTLENECK: LACK OF KNOWLEDGE AND AWARENESS OF EFFICIENT COOKING PRACTICES AND ICS



BEHAVIORAL SCIENCE LEVER: Information provided with a loss frame showing the potential cost of not switching the habit and reinforcing the need for it. Additional information promoting positive attitudes towards the product and its suppliers, such as identifying certified products.

SOLUTION ELEMENT: Messaging providing knowledge and positive attitudes towards bean-soaking through informative materials and sessions.

02

BOTTLENECK: TRADITIONS ABOUT COOKING AND APPROPRIATENESS






BEHAVIORAL SCIENCE LEVER: Social- based messaging introducing new practices to challenge existing beliefs about taste and cooking.

SOLUTION ELEMENT: Public demonstrations to introduce and establish new bean soaking habits.

03

BOTTLENECK: LIMITED MENTAL BANDWIDTH AND PERCEIVED TIME AVAILABILITY

Save Fuel!

-  Put your beans in a container and pour in water until they are covered.
TIP: PUT A LID OR COVER ON THE CONTAINER TO PROTECT AGAINST MOSQUITOS.
-  Leave the beans to soak for 3 hours or until they are twice their size.
-  Cook the beans until they are as tasty as you like them.

**DON'T MISS OUT ON SAVINGS
SOAK BEANS, SAVE FUEL**


BEHAVIORAL SCIENCE LEVER: Increasing behavior control with Easy-to-dos or checklists to reduce the resources and time required to make complex decisions that are not yet an established habit.
































SOLUTION ELEMENT: Easy-to-follow instructions to adopt bean soaking and identify supporting resources in their homes, for example, soaking containers.


04

BOTTLENECK: STATUS QUO BIAS

March 2023

 Colour in the tasty bean on days you soak them!

MON	TUE	WED	THU	FRI	SAT	SUN
						
						
						
						
						

 **Use an improved or a clean cookstove for even more benefits!**
These stoves save more time cooking, reduce harmful smoke and could save you money.

BEHAVIORAL SCIENCE LEVER: Timely reminders that induce habit formation, complemented by a public commitment to continue the behavior.

SOLUTION ELEMENT: Calendars for reminding participants of and tracking the days when they soak the beans and inviting them to take publicly visible pledges to continue following the practice.

V. RESULTS

The intervention led to a reduction of nearly 41 minutes (33% reduction) in the time taken to cook beans for the participants of the sessions, as compared to those who did not participate. This reduction also impacted the overall cooking time on the days when the beans were cooked, resulting in a decrease of 34 minutes (16% reduction). We did not find an effect on cooking time for days when beans were not cooked.

Additionally, we found more positive attitudes toward bean soaking and the adoption of other energy-efficient cooking practices. Participants reported a higher habit formation of bean soaking (53% increase), a more favorable attitude towards the taste of soaked beans (40% increase), and a better attitude towards savings from bean soaking (16% increase).

Finally, the intervention effectively increased the perceptions of the appropriateness of clean and improved stoves for bean cooking. Participants were more likely to aspire (12% increase) or expect (11% increase) to acquire improved or clean stoves.



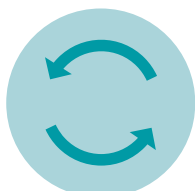
VI. POLICY APPLICATIONS¹⁰

This study is a valuable example of how a behavioral approach can inform the design, implementation, monitoring, and evaluation of programs and policies promoting clean energy access by addressing behavioral constraints while considering the underlying structural factors.



A COMPREHENSIVE APPROACH TO CLEAN COOKING ACCESS.

A behavioral approach to policy design involves using diagnostic analyses that apply qualitative and quantitative research methods to unpack barriers to obtaining these technologies. This study found that households face various barriers, such as lack of knowledge, interest, habituation, and mindset, in addition to financial and technological constraints. A hands-on training approach, like the one developed by this intervention, could be widely applied to tackle these barriers effectively. This approach holds promise to reduce stove stacking and increase the adoption and usage of clean cooking technologies.



ITERATIVE AND ADAPTATIVE DESIGN AND IMPLEMENTATION.


During the diagnostic stage of the project, qualitative methods were utilized to understand the needs and preferences of potential customers, suppliers, and sellers of ICS. This approach provided valuable insights and possible solutions that were not previously considered. Based on successful local and international experiences, the team developed seven solutions, which were evaluated for feasibility and context sensitivity. Prototypes were tested, and feedback was obtained from 100 participants from the target population. This iterative process helped identify the most appropriate and cost-effective solution: hands-on cooking training with tasting demonstrations and supporting interactive materials.



CONTEXTUALIZED AND PEOPLE-CENTERED OUTREACH.

Program activities should consider the use of appropriate communication channels, language, motivations, and timing of implementation. For instance, the intervention revealed com-

plementary outreach channels such as social demonstrations, WhatsApp groups, social media, SMS communications, and educational activities that could be used in outreach program efforts. Additionally, campaign messaging with an emphasis on personal benefits, a concrete call to action, participation requirements, and steps to follow could be more effective than traditional environmental-conscious content. Some of these recommendations were incorporated in the intervention materials and can be included in the outreach of energy access programs.



Tekera Aheza:

- Gives you a large discount on the price of a new improved or clean stove
- You can pick from many stove options that run on wood and other cleaner fuels
- You will have a warranty of at least one year

How can I benefit?

1. Select an approved stove from a company participating in Tekera Aheza
2. Buy the stove. You can pay in cash, Mobile Money, cheque, or bank transfer. You can also pay in instalments with PAYGO if offered by the company
3. Request a receipt of your purchase

You can benefit from the program if:

- Your household is from Ubudehe 1, 2, and 3 category. Female-headed households are particularly encouraged to participate.
- You are not currently using a clean cookstove as your main stove.
- You haven't used the subsidy already (only once per household) and are not benefitting from another stove program.

ENDNOTES

- 1 The present research, including the field data collection activities, has been financed by the Carbon Initiative for Development (Ci-Dev), a trust fund administered by the World Bank, under the grant TF0B5183.
- 2 International Energy Agency. 2023. Tracking SDG7: The Energy Progress Report 2023. https://trackingsdg7.esmap.org/data/files/download-documents/sdg7-report2023-full_report.pdf
- 3 Ibid.
- 4 World Bank. 2018. Rwanda Beyond Connections – Energy Access Diagnostic Report Based on Multi-Tier Framework. <https://documents1.worldbank.org/curated/en/406341533065364544/pdf/Rwanda-Beyond-connections-energy-access-diagnostic-report-based-on-the-multi-tier-framework.pdf>
- 5 Development Bank of Rwanda. 2021. Rwanda Energy Access and Quality Improvement Report. <https://clean-cooking.org/wp-content/uploads/2021/07/618-1-4.pdf>
- 6 Cook, G., Mulisa, A., Nkurikiyimfura, I., Gashugi, E. & Gaidashova, S. 2020. Revising Nationally Determined Contribution (NDC) mitigation and adaptation priorities for Rwanda. Kigali: Government of Rwanda
- 7 De Martino, S., Sousa, J. & Coony, J. D. 2021. Greener Living Starts with Cleaner Cooking. Behavioral Diagnostics Note. Washington, D.C.: World Bank Group.
- 8 Koo, B., Rysankova, D., Portale, E., Angelou, N., Keller, S. & Padam, G. 2018. Rwanda – Beyond Connections: Energy Access Diagnostic Report Based on the Multi-Tier Framework. World Bank, Washington, DC. <http://hdl.handle.net/10986/30101>
- 9 CGIAR. 2021. Research and development partnerships to strengthen inclusive and demand driven bean value chain in Rwanda. <https://www.cgiar.org/news-events/news/research-and-development-partnerships-to-strengthen-inclusive-and-demand-driven-bean-value-chain-in-rwanda/>
- 10 Chapter 3 from the following document provides actionable guidance on some of the recommendations outlined in this section: Energy Sector Management Assistance Program (ESMAP). 2020. Integrating Behavior Change in Energy Efficiency Programs in Developing Countries: A Practitioner’s Guide. ESMAP Knowledge Series; No. 029/20. World Bank, Washington, DC. <https://openknowledge.worldbank.org/handle/10986/34788>