

THE BOTTOM LINE

The COVID-19 pandemic has magnified household preferences for convenience and affordability, presenting challenges as well as opportunities for the transition to clean cooking fuels. Initial findings from a case study conducted in rural Kenya suggest that the pandemic and lockdown have altered household cooking practices and fuel-use patterns. Households in the study's intervention group used domestically produced biogas; those in the control group, chiefly wood, supplemented by liquefied petroleum gas and charcoal. Independent access to biogas insulated the intervention group from fluctuations in fuel prices and limits on access, while encouraging adoption. As recovery begins, the right policies can speed the transition to clean cooking fuels. Poor households—those most affected by the pandemic but least equipped to recover from its effects—will need the greatest support.

COVID-19's Impact on the Transition to Clean Cooking Fuels: Initial Findings from a Case Study in Rural Kenya

How are COVID-19 and cooking connected?

It appears that the pandemic has disproportionately affected poorer households lacking access to clean cooking solutions

The COVID-19 pandemic has dramatically changed our daily routines, with many of us spending more time in our kitchens than ever before. For those with access to modern cooking technologies and fuels, this translates into more meals prepared in comfortable surroundings. But what of the estimated four billion people around the world who lack access to efficient, clean, convenient, safe, affordable, and reliable cooking solutions (ESMAP 2020a)? Has the pandemic had harsher effects on households lacking access to such solutions? And what are the implications of the ongoing pandemic for the transition to clean cooking? This Live Wire sheds light on these issues using initial findings from a case study using focus group discussions (FGDs) in rural areas of Kenya's Kiambu county.

In October 2020, as part of a larger field study funded and managed by the Energy Sector Management Assistance Program and the Carbon Initiative for Development of the World Bank, Berkeley Air Monitoring Group conducted FGDs with women in rural households in Kiambu (BAMG 2020). The county borders Nairobi and has a population of 2.5 million (40 percent rural; 60 percent urban). The purpose

of the study is to gather evidence for use in quantifying and measuring the climate, health, and gender co-benefits of clean cooking interventions (ESMAP 2020b). Sistema.bio, a company that supplies biodigester packages, was competitively selected to participate in the study through an open solicitation process. It shared its customer list for the study. The FGDs were designed to inform the design of a household survey tool suitable for use in local communities. Specific objectives were to learn about local cooking practices, knowledge, and beliefs; habits in the procurement of cooking fuels; patterns in the use of time; and perceptions about gender roles and women's empowerment. With the advent of COVID-19, the FGDs also explored the pandemic's impact on cooking-related behavior.

The sample for the FGDs reported here included 300 households in Kigumo, a rural part of Kiambu county (see photo on page 2). Households were classified as middle class or skilled working class, according to the terms of the Living Standards Measure, which segments populations based on ownership of a wide range of products and services.¹

The sample was divided equally into intervention and control groups. Households in the intervention group were Sistema.bio customers that had purchased and installed domestic biodigesters 6 to 30 months earlier. Households in the control group were selected based on a profile similar to that of the intervention group in terms of location, age of the principal cook, and social-economic class. As noted, participating households ranged from middle class to skilled working class.



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¹ For details on the Living Standards Measure, see <http://www.saarf.co.za/lsm/lsm.asp>. On the definition of classes, see https://en.wikipedia.org/wiki/NRS_social_grade.

COVID-19 has had interacting effects on cooking and fuel use. The types and amount of foods cooked, the person doing the cooking, and the fuels used—all have changed to varying degrees.

Two all-female FGDs were held: one for the intervention group, with 10 participants; the other for the control group, with 9 participants. To ensure representative yet logistically feasible groups, the participants were randomly selected from the sample by age and location strata. Women over 60 were not included because of a government order prohibiting people over 60 from attending social gatherings.

At the time of the FGDs, the study communities were under a partial lockdown. A curfew was in effect from 9:00 pm to 4:00 am, and schools were closed. Mobility had been restricted in areas experiencing a high number of COVID cases, including the nearby Nairobi metropolitan area. Since a portion of the study area fell within this region, where many people in the communities work or do business, most participants were affected by the restrictions either directly or indirectly.

Has the onset of COVID-19 changed cooking practices?

Participants in both groups reported similar pandemic-related factors affecting their cooking behavior

The FGD participants in both the intervention and control groups agreed that the onset of the COVID-19 pandemic and the associated lockdown had (i) reduced their mobility owing to travel restrictions and higher transportation costs; (ii) pushed up food and fuel prices; (iii) cut household income; and (iv) raised the number of household members at home during the day. These and other factors have had interacting effects on cooking and fuel use. The types and amount of foods cooked, the person doing the cooking, and the fuels used—all have changed to varying degrees.

Types of foods cooked. Both groups reported changes in the types of food they cook, driven mainly by price increases for staples such as oil and cereals. Inflation, combined with lower household income, has led many of the participants to cut their consumption of dishes that require more expensive ingredients (e.g., *chapatti* and soups cooked with animal bone). Instead, they have increased their reliance on foods they farm themselves or can obtain locally, stretching their household budget and permitting them to stay closer



Focus group discussions with women in Kiambu county, Kenya

Photo courtesy of Eco Research.

to home. One knock-on effect of higher food prices and the desire to build robust food reserves was that household money earmarked for school fees, travel, and festivals was spent on food instead. The reallocation had no significant consequences, since the activities for which the funds were originally intended were not permitted during the lockdown.

“The economy is bad ... and the price of oil is high, [so] we reduce cooking *chapatti*. Those meals that spend more money, we reduce their consumption.”—Participant in intervention group

Time spent cooking and quantity of food cooked.

Participants in both groups also reported changes in the amount of food they cooked and the number of times they cooked each day. The main driver for these changes has been greater demand for food cooked at home since, owing to lockdown restrictions, more members of the household are at home during the day rather than at school or work. As a result, women are spending more time and money feeding their families, despite having more limited resources.

Since the onset of COVID-19, charcoal and LPG have become more scarce and more expensive.... Participants in the control group reported increased use of wood and other biomass obtained close to home and reduced use of LPG, extending cooking times.

Some of the extra cooking tasks imposed by the presence of children and teens at home appear to have been assumed by the youngsters, sometimes without supervision, implying a greater risk of accidents. Viewed conversely, this development could also enable young people to develop new skills, which, in turn, could affect time-use patterns and post-pandemic empowerment.

“School-going children are now at home.... I was cooking half kilogram of rice, but now I had to add so that they can have something to eat. They also take tea and a snack at 10:00 am in school, which I have to provide now.... We are spending more on food....” — Participant in control group

“When there was no coronavirus, children were going to school from 5:00 am, and I was going to work..., so my kitchen was closed at 9:00 am and opened again at 6:00 pm. But now everyone is around, so we are using the kitchen more.” — Participant in intervention group

Have the intervention and control groups been differently affected?

The intervention group reported less fuel stacking and less time spent cooking

Patterns of stove and fuel use. Participants in the control group reported using firewood as their primary cooking fuel, supplemented by various combinations of liquefied petroleum gas (LPG) and charcoal. The use of more than one cooking fuel, a practice known as fuel stacking, was common. For example, if quick cooking is required, LPG will be used. For heating water or preparing typical meals that require slow cooking (e.g., *githeri*), wood is used. During the wet season, charcoal and LPG are used more often than they are in dry weather.

Participants in the intervention group reported less fuel stacking, relying chiefly on domestically produced biogas. They use wood as a back-up when the gas supply is less reliable (see below)—and for specific tasks such as warming water to wash cows before milking, heating laundry water, and cooking *githeri*.

Biogas is a mixture of methane, carbon dioxide, and other trace gases. It is produced in biodigesters—airtight vessels in which

kitchen waste, cow dung, crop residues, and other organic material is deposited and allowed to ferment. Reliability can be impaired in cold weather, when water condenses faster in the biodigester's gas line, making it necessary to empty one of the water traps in the line. Also, gas production can drop with cold temperatures, and families are instructed to load less manure and to use counterweights to ensure access to all of the gas in their digester.

Since the onset of COVID-19, charcoal and LPG have become more scarce and more expensive. The associated lockdown has particularly affected the affordability of LPG owing to reduced access to the fuel and higher transportation costs. In response to the high incidence of cases in the Nairobi metropolitan area, movement restrictions were imposed. Providers of essential services could obtain certificates to allow unrestricted movement, but smaller LPG vendors were denied because the scale of their operations was insufficient for them to be considered essential.

With many local LPG vendors unable to travel to Nairobi to resupply, consumers, like the vendors themselves, were forced to travel long distances to obtain fuel from areas in which movement had not been restricted. Even though some restrictions had been lifted at the time of the FGDs, the participants reported that inflated prices had not yet eased, and they worried that prices might not return to pre-COVID levels.

“There was a time that gas was expensive and scarce..., which changed the way I cooked.” — Participant in control group

“Some vendors will not lower the prices after [the pandemic]; they will take advantage of the high prices and continue selling it the same way.” — Participant in control group

“Before I had biogas, I had to save to fill my gas cylinder.... It's easier to cook with gas than firewood, but now biogas is easily accessible: no cost involved to go and buy gas. It has helped me economically.” — Participant in intervention group

The intervention group's low reliance on LPG—relative to the control group's—has limited COVID-19's impact on its fuel-use patterns. By contrast, participants in the control group reported increased use of wood and other biomass obtained close to home and reduced use of LPG. Some reported paying for a tree to be cut, split, and delivered.

COVID-19 is nudging middle-income households to switch to modern cooking fuels (biogas and electricity), because these have been less disrupted by the COVID restrictions. However, absent external support, COVID-19 will push poorer households further down the energy ladder.

Time spent cooking. Switching from LPG to wood among the control group has extended cooking times. Participants in the intervention group, by contrast, did not report changes in time spent cooking, because their use of domestically produced biogas for cooking is not affected by the pandemic. Instead, they reported an overall reduction in time spent cooking compared with levels prevailing prior to installation of their biodigester. A key factor is that the biogas stove has two side-by-side burners (see photo opposite). Previously, many participants had used several stoves, often located in separate rooms, or had used one stove over a longer period of time. The participants reported that biogas stoves are easier and quicker to light than their previous wood stoves. Also, they observed that their husbands and children were cooking more, since cooking with biogas is easier and more pleasant than cooking with wood.

Has the COVID-19 challenge presented opportunities?

COVID-19 has magnified household preferences for convenience and affordability, presenting both challenges and opportunities for the transition to clean cooking fuels

The pandemic has stimulated a stronger demand for biogas and greater interest in alternative fuels, particularly among middle-class households.

The focus groups demonstrated that lower reliance on LPG and wood among participants in the intervention group has limited the impact of the pandemic on their fuel-use patterns relative to those of the control group. Moreover, discussions with Sistema.bio, the biogas company, indicate that the COVID-19 situation may have stimulated interest in biogas and other alternative fuels. In 2020, the company reported higher sales than in previous years and better repayment rates, as families seem to value the biogas technology as an energy source. Anecdotal evidence from sales agents and technicians suggests that consumers are increasingly interested in energy independence, especially if it means not having to travel to buy fuel.

Looking ahead, what are the policy implications of the pandemic's effect on cooking practices?



Kenyan kitchen equipped with a biogas-burning stove.

Photo courtesy of Dana Charron..

Undoubtedly, COVID-19 is having a profound impact on everyone's life, including their cooking behavior. It has changed what is cooked and how often, increased the number of family members at home during the day, and raised household spending on food and fuel while lowering household incomes. Some of these changes may be temporary—others may trigger permanent changes in households' cooking fuel choices.

COVID-19 is nudging middle-income households with less severe affordability constraints to switch to modern cooking fuels (biogas and electricity), because these have been less disrupted by the COVID restrictions. The case study in rural Kenya illustrates the greater resilience of biogas-using households, and increased sales of other clean cooking products have been reported. For example, interviews with other cooking companies revealed that an ethanol cooking company in Nairobi has increased its sales over previous years as middle-income households have diversified their cooking options. And a social enterprise that makes and distributes clean, efficient cookstoves has reported sales growth over the pre-COVID

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period, despite a newly imposed 14 percent value added tax in effect since July 2020.

However, affordability and accessibility remain major barriers for lower-income households amid the pandemic. Absent external support, COVID-19 will push poorer households further down the energy ladder, forcing them to continue to rely on traditional biomass for cooking and further exacerbating adverse effects on health, gender equity, and the environment.

As societies recover from the pandemic and rebuild, governments should consider clean cooking an essential service and a critical part of the pandemic response. Apart from using stimulus funds to build green infrastructure, the recovery provides an opportunity to integrate energy planning and tackle clean cooking challenges. Demand for cooking energy should be an explicit part of national energy planning, with a target of ensuring universal access to clean cooking. National roadmaps to universal access to clean cooking should be guided by a least-cost, best-fit strategy that reflects diverse users' needs, local market conditions, and national comparative advantages in energy resources, which can further guide investments in infrastructure and programming.

More budgetary support will be needed for poorer households, those most affected by the pandemic but least equipped to recover from it. Such support could take the form of conditional or unconditional cash transfers or results-based grants that provide cash incentives to eligible households to enable them to acquire certain

technologies for the purpose of achieving improved access to clean cooking and associated health, gender, and climate benefits.

By making clean cooking a policy priority, we can rebuild better, turning challenges into opportunities to ensure a healthier, greener, and more equitable recovery.

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