# Impact Stories Booklet

# on

# Modern Cooking Technologies (E-cooking/Biogas) In Kenya


**Authored by:**

Emily Bolo, Haron Akala, Tom Randa, Joanes Atela, Paul Osogo, Wairimu Njehia, Christina Kiwiri, Ruth Wanjiku, & Enoch Owuor



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## Foreword

MECS Kenya is pleased to share with the public its impact story booklet on "Modern Cooking Technologies", 1st Edition narrating the stories of local community champions who have embraced clean cooking technologies.

The stories contained in the booklet are non-fictional tales of individuals drawn from five different regions within Kenya namely Nakuru, Kisumu, Nairobi, Kitui, and Makueni counties to spur interest and bring a revolution in the cooking sector.

This edition contains the narratives of 18 clean cooking champions on their experience with polluting and inefficient fuels i.e. biomass vis-à-vis clean fuels i.e. electricity and LPG. The photos in this booklet were taken and used with the consent of all the participants.

We are optimistic that our audience will find the contents of this booklet inspiring enough to trigger a paradigm shift in their way of cooking considering that it is the real-life events of people they can relate with. The change that you want has to start with you.

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## Background

Many communities in Kenya, especially in rural areas still rely on biomass energy. However, such cooking practices not only have adverse health impacts on human health but also on the environment that is already being compounded by several challenges including climate change. Women and children are mostly affected by the associated negative impacts of household air pollution attributed to biomass energy in the African setting. *According to the World Bank*, subjection to household air pollution has been associated with low birth weight, escalating the risk of ill health in a person's lifetime. That is besides the direct health burden of premature deaths and poor health. For example, in 2013, the cost of air pollution at the family level was estimated to be $1.5 trillion in terms of welfare losses, mainly due to health impacts in low and middle-income nations, a figure equal to 3.3% of the GDP. This first-order human and environmental health concern, which can be avoided, has been the drive behind the recent campaigns aimed at promoting the adoption of clean cooking methods.

Apart from the apparent negative impacts of biomass fuel burning on indoor air quality, it is likewise responsible for ambient air pollution and thus contributes significantly to the greenhouse gas emissions. The *World Bank reports* that approximately 12% of the worldwide average fraction of ambient PM2.5 is as a result of household cooking. In some instances, the demand for the use of biomass energy has led unsustainable extraction and use of the available biomass

leading to environmental degradation e.g forest degradation, biodiversity loss, and shrinkage of wildlife habitat. In scenarios where cooking fuel has to be bought, the rising prices of biomass fuels such as charcoal and firewood further burden the already poor households in the Sub-Saharan Africa where the use of biomass cooking fuel is common among the low-income households. On the other hand, where households do not have to purchase the cooking fuel, considerable time is typically spent collecting firewood, primarily by women, which could have been utilized for alternative significant income generation activities, childcare, education, or leisure. As such, adopting modern cooking solutions could help solve some of the mentioned problems and free up the time needed to engage in other profitable economic and social activities.

Finally, the high population growth rate coupled with rapid urbanization further adds to the biomass sustainability issue due to the increased demand for cooking fuels and many rely on biomass fuels. The use of charcoal for example is common and the demand increases with the increasing population despite its adverse health and environmental impacts. While using charcoal fuels may not be considered as dirty compared to firewood regarding the effects of household air pollution, its impact on forestland is four times more than that of wood fuel. This is because nearly *75% of the chemical energy from* trees is lost in the process of converting it to charcoal. There is, therefore, a need for households to transition from the use of solid fuels to more clean and sustainable ones.

Though some households have already transitioned to using clean cooking methods such as e-cooking and biogas fuel use, the rate of adoption of such clean cooking technologies and fuels have been relatively slow in Kenya. For this reason, this article seeks to showcase some successful case studies of households in various parts of Kenya who have embraced modern energy cooking services and their experiences in attempts to spur interest in clean cooking among the Kenyan population.

# Clean Cooking Impact Success Stories

## Nakuru County

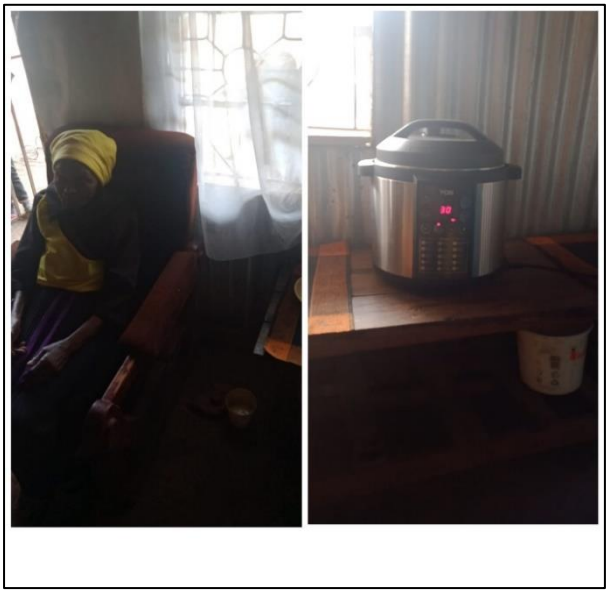

*Figure 1: Mary patiently waits for her pancake to cook in the EPC. (Photo credit: Emily, ACTS)*

### *Impact Story Case 1: Mary Wanjiru's Household*

Cooking does not have to be a dreaded activity but one that is looked forward to. Nonetheless, that was not the case for Mary Wanjiru, an elderly woman in her 80s residing in Nakuru County, Kiamana centre. Mary lives with her husband in their small home. All her children are grown and have moved to their own homes. The only person remaining in the compound is one of her granddaughters, who occasionally lends her help whenever she needs it. The thought that she always had to prepare food for her husband and herself during meal times was one thing she never welcomed.

As far as she can remember, Mary has always been using firewood and charcoal as her main sources of fuel to prepare meals for her family. To her, that was not a big deal then, as it was the norm within her community. Nevertheless, as she advanced in age, cooking using traditional methods became an activity that she wished she did not have to engage in. Considering her age, she says, "*having to light up charcoal or firewood to make my food is nowadays becoming difficult for*

*me*," something that may help explain why she never looked forward to it. Besides, she used to experience chest pains as a result of the smoke she ingested that emanated from burning firewood.

Lucky enough for her, everything changed when her granddaughter got the chance to work with SCODE for a short duration. SCODE is a community-based organization based in Nakuru that majorly deals with green energy and works in partnership with ACTS through the MECS project to facilitate the adoption of clean cooking solutions. In her stay at SCODE, her granddaughter learned about the MECS pilot project and decided to share the same information with her grandmother. Afterward, Mary enrolled to be part of the pilot project and qualified upon which she was presented with an EPC as an incentive to participate in the research that involved filling the cooking diaries.

According to Mary, the EPC has transformed her life completely as noted, *"At my age, it is more than a blessing to me and it is something that all women my age should have"*. Her body language cannot deny the joy on her face. With no one to send around, she considers the EPC to be a lifesaver to her given its versatility and effectiveness "*Previously, I used to get tired a lot from all the activities that I had to do to make sure food was on the table. But now, I get to prepare most of my meals within 10 minutes*," "*Moreover, I can now drink warm water and take birth whenever I feel like, regardless of the time. Unlike before, I can no longer afford to go hungry for extended periods since when my energy levels are down, I*

*quickly prepare something light to keep me going,"* she remarks. Evidently, when we arrived at her home, we found her preparing pancakes. From a health point of view, she no longer experiences chest pains since she started using the EPC, which was attributed to the smoke from firewood or fuel that she inhaled in the process of lighting and cooking.

*Figure 2: Mary's pancake cooking in the EPC. (Photo credit: Emily, ACTS)*

Her biggest joy is attributed to the fact that the rains do not scare her anymore. In the past, she used to worry a lot whenever it rained as that implied that she would either have to postpone her cooking as she could not cook with wet firewood or incur extra costs and buy charcoal. Another thing that has impressed her with the EPC relates to the cooking of ugali. She says that "*with it, there is no wastage of maize flour since none of it gets stuck at the bottom of the pot*." Before she could use 1kg of ugali flour for two meals but now she can use the same amount for three meals**.** Besides, she has extra time to do other chores that she was not in a position to do previously. Having to go look for firewood and light it up prior to cooking robbed her of most of her free time. She now confesses that she has more time permitting her to engage in activities such as washing her clothes. Before, she had to arrange with her granddaughter to come to do laundry for her.

With regards to whether she experienced any difficulties initially on how to use the EPC, she responded saying, *"It was not challenging for me to use it as I was guided by the manual and my daughter has also demonstrated on how to use the gadget. Therefore, I would advise to women of age not to be in a hurry to use the EPC when they get one but to keenly go through the manual to be able to understand how it is used. If anyone is unable to read, they can request those within their reach to explain to them what is written in the manual."*

Mary does not see herself going back to her previous methods of cooking but vows to continue using her EPC for all her cooking needs. She has both electricity and solar installed in her house. So should there be power loss, she quickly switches to solar.

### *Impact Story Case 2: Miriam Njeri Wangombe's Household*


*Figure 3: Miriam displaying her EPC. (Photo credit: Emily, ACTS)*

Miriam Njeri Wangombe is a medium-aged woman residing in Heshima, Kiamana Center in Nakuru County. She is staying with her 2-year-old grandchild as some of her children are in high school and others are in their own homes away from her. She narrates her experiences with electric pressure cookers, which she started using on the ***23rd of December 2021*** as part of a pilot project run by SCODE in collaboration with the UK government.

Previously, Miriam used to fuel stack using firewood, charcoal, and LPG for her cooking needs with firewood being predominantly used. *"However, sometimes I could be compelled to use any available materials that were within my reach like polythene bags if my firewood ran out while I was still cooking and had no viable option."* she states. Though she knew the harmful effects of using such materials, her immediate concern was getting the food ready.

Life took a turn for the better for Miriam when she received her EPC appliance. She could now prepare meals that initially took longer for a shorter duration and meals became even tastier. She attributes the increased taste of food to the fact that when cooking with an EPC, no moisture is lost as they are retained within the cooking pot. Most importantly, she claims, "*electric cooking is cheaper than the cooking methods I had used in the past to prepare meals*." One thing that she liked most about the EPC was the convenience and efficiency. The mere fact that she could pre-set cook time, do whatever errands she had for the day, and come back home to find her meal ready was just fantastic. Also, regardless of when she arrived home, she always found her meals hot. She tells me that with the EPC, "*I do not need a hotpot as it can keep the food warm for up to 8 hours.*"

She further mentions that the appliance brought love and joy to her home: "*In my family, our favourite meal is Njahi*," she says. Njahi is a staple food in her community. *"However, none of my kids ever wanted to be tasked with the responsibility of preparing it considering the long boiling time required,*" she

adds. As such, it always caused disputes within the family whenever one was tasked with the duty of preparing it since it meant that they would have to wait for 5 hours, and therefore, had to put aside whichever plans they had aside until the meal was ready. Nevertheless, with the EPC, work became easier as it only takes 90 minutes for the Njahi to be cooked. "*Whenever around, my children no longer complain but instead look forward to when next it will be prepared. Even when visitors pop in unannounced, I do not have to worry about what they will eat considering the short time required to make it ready*," she states.

In terms of health, she boasts of the fact that she can now eat clean food free from the smell of smoke or other particles that used to find their way into her cooking pot while preparing food in an open place. Moreover, she points out that her granddaughter never coughs as often as she did when she was using biomass fuel and that the frequency of her running nose has reduced. On her side, her eyes condition has improved as they used to be watery before. On asking her whether she may reconsider using the traditional cooking methods that she previously used, she noted: "*After experiencing all the benefits that come with the use of an EPC, I don't see myself using biomass unless forced by situations beyond my control*."

*Figure 4: Phoebe preparing supper for her family using an EPC. (Photo credit: Emily, ACTS)*

*Figure 5: Phoebe in the process of softening her onions and tomatoes. (Photo credit: Emily, ACTCS)*

## *Impact Story Case 3: Phoebe Wairimu's Household*

Phoebe Wairimu is a young woman living in Heshima, Kiamana Center in Nakuru County. She resides with her husband and children. She is the participants of the pilot project championed by SCODE in partnership with the UK government. While visiting her at home around 7.00p.m, we found her preparing supper for her family using the EPC. Her husband was not yet home, and her children were playing in the living room, so it was easier to engage her in the clean cooking discussion.

*Figure 6: Phoebe's stew mixture of potato and cassava. (Photo credit: Emily, ACTS)*

From her face, it was evident that she enjoyed cooking with the EPC. "*I do appreciate the technology and I cannot compare it to the cooking methods that I had been using before*," she states.

"*For a start, it is easy to use, convenient, and safe. The foods I prepare are tastier and what excites me most is the fact that I can cook from the comfort of my home even at night,"* she adds.

Until recently, she still fuels stack (firewood, charcoal, and LPG) for her cooking needs. She mainly used firewood and charcoal with the LPG being occasionally used. She mentions that when she was still using the traditional cooking methods, her family members often complained of headaches, coughs, and flu, which have reduced in frequency ever since she started using the EPC. The smoke emitted from the use of firewood meant that she had to prepare her meals outside the house, even at night. She dreaded this most, "*given that I live in a secluded environment, I was always afraid when cooking out at night. The thought that I might be an easy target for attack by people with ill intentions made me fearful. In as much as I had the option to cook early enough before it was dark, the fact that the food will get cold and I may have to light up the*

*fire again to rewarm it was not a viable alternative*," she narrates.

Phoebe thus considers the EPC life-changing for her and does not see herself going back to the use of biomass fuel. To her, getting to know how the appliance is used was not difficult for her, as she had witnessed severally through cooking demonstrations organised by SCODE. With the EPC, she can do dissimilar chores at the same time such that by the time she goes to bed, her kitchen is clean with no dirty dishes. She prides on the fact that her house is free from cockroaches and rats initially attracted to dirt.

*Figure 7: Gibson and his wife. (Photo credit: Emily, ACTS)*

### *Impact Story Case 4: Gibson Kamau's Household*

Gibson Kamau is a middle-aged man residing in Mbaruk, Nakuru County. She lives with his wife and children in a rural neighbourhood that is characterized by cattle rearing and poultry farming. Since the area is a bit rocky, there are not so many agricultural activities taking place. The area is similarly not connected to electricity and residents have to rely on alternative energy sources for their lighting and other amenities.

To Gibson and his family, their favourite dish is Githeri, a mixture of beans and maize. Githeri is a staple food for many community members. It is a food item that averagely takes 3 hours for it to be ready. To prepare it, they normally rely on the use of firewood as the main fuel source. Firewood is also the fuel source that they use to cook most of their dishes with the LPG being rarely used. "*Though we may want to feed on Githeri regularly, sometimes time becomes a constraining factor*," says Gibson.

For lighting their home and other amenities such as radios and television, they previously depended on the battery system, which they had to recharge now and again. With time, he states, "*the cost of recharging the battery began taking a toll on me financially that we would some days go without light whenever I did not have the money to recharge the battery*." In addition, the family has school-going children who they have to ensure they reach school on time. Hence, "*my wife had to get up early enough daily to light fire and prepare breakfast for them before they leave for school after which she would engage in other daily activities*." The routine of waking up early to prepare breakfast and the long hours it took to ready some of the dishes with time started becoming a challenge for my wife. As such, they started hoping for something that could make their lives easier and better.

In 2017, a team from SCODE, visited the Mbaruk area to promote the use of EPCs. Gibson was around then and decided to take advantage of the opportunity to know more about the EPC. Lucky enough, he was able to benefit from the program and received an EPC at no cost after some training sessions on its use. No longer did they have to wake up early to prepare breakfast as with the EPC, all they needed was less than 10 minutes to make everything ready. Besides, the EPC made their milking work easier as they could now boil water for washing their cows' udder before milking, which helped stimulate the flow of milk and consequently guaranteed them more milk. Most importantly, they could now cook their favourite meal, Githeri, as often as they wished in less than an hour. Life was indeed becoming beautiful.

*Figure 8: Picture of solar panel installed above the roof of Gibson's home. (Photo credit: Emily, ACTS)*

*Figure 9: Photos of EPC and the solar battery used to power it. (Photo credit: Emily, ACTS)*

Given that electricity has not penetrated the area, they were given a battery-powered pressure cooker that depended on

energy installed from solar panels. As such, the solar panel did not only guarantee that their pressure cooker was powered but also ensured that they could light their bulbs and enjoy other services that come with electricity. "*Though we do not have electricity, I am at ease since we get the same services that we would if we were connected to the grid. Nonetheless, I would appreciate it if electricity could be accessed in the area as that would make cooking more fun since it will be possible to explore different recipes. Though the battery-powered EPC helps prepare foods that require long boil time, it is not as versatile as the electronically powered EPC and its effectiveness may be limited during cold and rainy seasons*," says Gibson.

*Figure 10: From left: Naftali Macharia (Mbaruk resident), Ruth Wanjiku (SCODE), Emily Bolo (ACTS-MECS), and Gibson Kamau (Mbaruk resident). (Photo credit: Bodaboda rider)*

## Kisumu County

### *Impact Story Case 5: Mary Akinyi Nahone's Household*

*Figure 11: Mary Nahone (Photo credit: Emily, ACTS)*

Mary is a middle-aged woman in her 60s residing in Dunga beach. She lives with her husband and has 4 grown children who have already moved to their homes. She started using biogas in 2017 in what she believes to have been a blessing in disguise.

For her cooking needs, Mary had been primarily using firewood that she had to collect daily. She considered this a cheaper option as she did not have to purchase firewood. The only time she incurred an expense was when it rained and had no alternative but to buy charcoal, which according to her was costly. Though she knew that using firewood could lead to some health effects, she overlooked them as her only motivation for using the fuel source was centred on the fact that there was no monetary cost attached to it. "*To light up my fire, I had to blow it. However, the smoke that came from the woods before the fire could be ignited always affected my eyes*," she says. With time, her eyes condition worsened, and she progressively began to lose sight.

*Figure 12: Biogas stove. (Photo credit: Emily, ACTS)*

Her deteriorating eyesight forced her to visit an eye specialist to determine the problem and how it could be addressed. Upon examination, her doctor recommended that she stop using firewood and charcoal for her cooking as they contributed to her eye problem. This was not easy for her to take since for as long as she can remember, those were the only fuel sources she had been using and which almost everyone in her neighbourhood uses.

Lucky enough for her, during the same time that she was grappling with her condition, Biogas International, Kisumu branch, in collaboration with piloted a biogas project aimed at replacing the use of biomass fuel with clean energy solutions. Biogas is a form of clean energy that is renewable, something that makes it to be the most affordable type of clean energy. The project aimed at installing biogas plants in 50 households from the Dunga area. The criteria used was centred on age, with the elderly targeted as the project's beneficiaries. Biogas International has been working closely with the African Center for Technological Studies under the Modern Energy Cooking Services, Kenyan Chapter, to speed up the adoption of clean cooking services throughout the country.

*Figure 13: Emily and Mary. (Photo credit: Enoch, Biogas Internationl)*

For Mary, the timing at which she had the biogas installed in her homestead was more than a blessing. "*Based on the doctor's recommendation, I had been wondering about the cooking method that I will adopt. Given my financial situation, I could not think of any alternative that I could afford*," she states. To her, the biogas came in handy at a time when she needed it most.

"*I use biogas for all my cooking needs. It is easy to use, and I can prepare my meals from the comfort of my home. Thanks to it, my life has become bearable. With my blindness, it would have been difficult for me to go and look for firewood for use. But now I do not have to worry about that. Moreover, I now have ample time to rest, and I can cook whenever I feel like*," she says. Particularly, she thanks Enoch of Biogas International who has been of much help to her and who has taken it upon himself to ensure that there is always a gas supply in her biogas system.

## *Impact Story Case 6:* Margaret Ongewe's Household

Figure 14: Margaret Nahone. (Photo credit: Emily, ACTS)

Margaret is an elderly woman in her 80s living in Dunga beach. We arrive at her home at around 12.10 pm and she immediately offers a prayer before greeting and welcoming us into her home. She transitioned to clean energy in 2018 when she started using biogas.

Figure 15: Businesswomen frying fish using firewood at the market. (Photo credit: Emily, ACTS)

Previously, Margaret solely relied on firewood to prepare her meals. She had to go and fetch the firewood herself before making food for her family. A quick gaze into the community and all one can see is households and businesswomen using firewood for their cooking oblivious of the effects their choices of cooking methods have, not only on their health but also on the environment. Unlike Margaret, most businesswomen in the area have to buy firewood to prepare their foodstuffs. Having to collect firewood may not be feasible to them as that would mean spending the whole day gathering fuel needed for cooking

given the amount of wood needed to sustain their business. Nevertheless, when compared to biogas, the use of firewood is a bit expensive since on average, it would cost the businesswomen around Ksh. 300-400 to fry their fish using biogas against an average of Ksh. 600-700 when using firewood for an equivalent amount of work.

When she began using biogas, things changed for her: "*I never knew there could be a cheaper option for cooking that is much safer and not involving*," she says. What fascinates her most about the cooking method is the fact that she enjoys clean cooking services at no cost since all that is needed to sustain the gas are animal droppings and food wastes: "*Things have become easier for me as I no longer have to fetch firewood for cooking. I get to have ample time for resting and doing other things that I was unable to do in the past,*" she adds.

In addition, Margaret claims that she has noticed a great difference in her health ever since she started using biogas. Considering her age, the change in health status could be attributed both to the clean air within her home and the ample time she has to rest.

## *Impact Story Case 7: Eunice Atendo's Household*

*Figure 16: Eunice Atendo. (Photo credit: Emily, ACTS)*

*Figure 17: Enoch of Biogas International besides a biogas plant. (Photo credit: Emily, ACTS)*

Eunice is a middle-aged woman in her 40s. She lives with her husband and five children in Dunga beach. Three of her children are in college while two are in primary school. Besides being a wife and a mother, she is a businesswoman who fries and sells fish. She started using biogas in 2018 and narrates her experience with it. In the past, Eunice used fuel firewood, charcoal, and kerosene stove to prepare her meals. She used firewood the mostly. On average, she would spend approximately Ksh. 220 on fuel. In the morning, for her breakfast, she would spend average Ksh. 50 on kerosene, Ksh.70 on charcoal for lunch, and Ksh. 100 on firewood for supper. While relying on cooking such fuels, she confesses that her children used to get sick often. They would regularly cough and complain of chest congestion. Furthermore, she says, "*During lunch, I used to prepare my meals with a charcoal stove while inside the house, something whose effect I saw first-hand, not once but several times*". Due

to the heat and pollutants produced by the charcoal stove, her third born child would habitually blackout whenever she was cooking inside the house. Though she was aware of the impacts of the use of biomass, she continued using them as that seemed to be what everyone within her surrounding was using.

Nonetheless, life took a different trajectory in 2018 when she qualified as a beneficiary of the biogas project. Life changed for the better for her entire family. "*My home is ever clean and my children are no longer coughing,"* she says. Before, the soot produced from the use of biomass was not only unhealthy but also messed her home. Besides, she now channels all the cattle and chicken droppings into the biogas plant, an act that leaves her compound clean. She also boasts of the fact that they are now eating clean food and that her cooking pots do not get dirty. As such, she does not have to expend much energy cleaning them.

Since she is no longer using money to purchase charcoal or firewood, she decided to buy an LPG (gas cylinder) with the money she had saved for use as an alternative fuel when in crunch of time. It is worth noting that with the clean cooking fuels, her husband occasionally decides to help her with her cooking needs, especially at night: *"I sometimes come home after work only to find out that my husband has already prepared dinner,"* she narrates. Her husband could not do this previously, given that he has an ego to safeguard as a man. He would not have wanted to be seen cooking openly in the fireplace as much as he tried to help. Margaret thus feels

relieved from having to do all the cooking chores at home thanks to the clean cooking technology.

### *Impact Story Case 8: Evelyne Khisia's Household*

*Figure 18:* Evelyne Khisia narrates her experience (Photo credit: Ruth, Gamos)

Evelyne is a trainer at Ramogi Institute of Applied Technology (RIAT), Kisumu. To her, the EPC is a new technology that she came to learn about a day to the e-cooking hub that was launched in Kisumu County on the 29th of June 2022. Nevertheless, she had a very good experience from the training that was done a day to the launch, and she got to learn so many things about the appliance. According to her,

1. The EPC saves on time. One gets to prepare their cereals in the shortest time possible, thus creating time to do other things.
2. It is affordable compared to the cost of charcoal, wood and other cooking fuels, especially biomass fuel.

3. It is clean energy. One is not limited to the kitchen. Food can be prepared while chatting with friends and family in the sitting room.
4. It has a hidden advantage. The mere fact that food is cooked in its medium implies that little water will be used in the process. The little water used helps to save on nutrients. She believes that most of the time nutrients tend to be washed away while cooking because of too much water used to boil cereals that are afterward discarded.
5. Though a new technology, it is easy to operate as all the functions are programmed.

She concluded by stating that it is a very nice technology that should be embraced not only at the institutional level but also at the household level.

## *Impact Story Case 9: Linda Otieno's Household*

*Figure 19:* **Linda Otieno shares her experience (Photo credit: Brian, CCAK).**

Linda is a student at RIAT undertaking a diploma course in food and beverage. She was among the five students trained to be champions of e-cooking technology before the e-cooking hub launch in Kisumu. During the initial training, she was impressed by the fact that little effort is exerted while cooking with an EPC and the less time taken to prepare heavy meals made her feel at peace with it. To Linda, the technology is more convenient than other cooking fuels since energy is retained in the gadget, and none escapes. Though she interacted with it for only a day, she recommends its use because of the benefits she got to see on a first-hand basis.

## Nairobi County

### *Impact Story Case 10: Batuli Nduga's Household*


*Figure 20: Batuli Nduga. (Photo credit: Paul, ACTS)*

Batuli is a middle-aged businesswoman residing in Kahawa Wendani, Ruiru County. She runs a small hotel that began its operations in December 2018. What is captivating about her business is that she has embraced clean cooking technology in her eatery despite its small size. Unlike her, many businesspeople around the area still use biomass such as firewood and charcoal to prepare foodstuffs.

When she started her business, Batuli depended on using charcoal and LPG for cooking her food items. "*I had three charcoal stoves that I used to prepare most of my cereals with*

*the LPG being used to make chapatis and mandazis only*," she narrates. "*Given the long time needed to boil grains, I could not manage with one charcoal stove if I were to serve my customers on time*," she adds. One stove was used to boil beans, the second to boil green grams, and the third to make tea. On a daily basis, she spent an average of Ksh. 600 for fuel; four tins of charcoal @ Ksh. 100 each, and Ksh. 800 to refill her 6kg LPG cylinder, which lasted 4 days. She also mentions that her charcoal would often go to waste if she had finished her boiling and had nothing to place on the stoves. Luckily enough for her, things changed for the better a year later when BURN manufacturers visited the area promoting the use of EPCs. The offered deal appeared lucrative for her as it had a "*Lipa pole pole plan*" (pay on instalment). She thus took advantage of the offer, bought an EPC with a capacity of 8 litres, and paid the cost for 9 months.

With the EPC, she could now manage her time effectively. It only takes her 45 minutes to have her beans ready, 6 minutes for the green grams, and 12 minutes for pilau. Soon she started receiving more customers since the taste of the food she was preparing improved. Besides, the less time she spends on cooking was an advantage to her as it meant that there was always food ready in case a customer passed by regardless of the time. Given the effectiveness of the EPC, she decided to buy an induction cooker to use for her chapati and mandazis. However, she stopped using it after a few months when she realized spilling oil affected its efficiency. In addition, it

likewise became possible for her to run her shop by herself. "*Most of the employees I normally hire to help me around tend to quit after a few days claiming that the work is too much for them. For example, the last one that I employed quit after a day as she could not handle the pressure*," she states. "*So, I decided that I would no longer look for someone to help me with the business but operate it alone considering that I have much time than I did when I was using biomass,*" she adds.

Regarding the cost of electricity, there was a remarkable difference in the amount used to purchase tokens. Batuli says, "*When I solely relied on the EPC and induction cooker for my cooking needs, the daily amount of money I would use for my electricity was Ksh. 150, down from Ksh. 600, something that increased my profit margin*." While the use of clean cooking technologies has many benefits, what interested Batuli more was the little amount of money she had to spend for fuel and the shorter cook time. This prompted her to recommend the technology to some of her business friends in the same but complementary industry. Interestingly, two of them bought the idea and purchased EPCs for their business. Worth noting is that one of them, whose shop is next to Batuli's, bought 4 EPCs that she uses to boil different types of cereals and sell to her clients after she saw how economical and time-saving the appliance was.

According to Batuli, the main challenge she has been experiencing with her business is the reliability of electricity.

Occasionally, she experiences power interruptions that greatly affect her business. For instance, when we visited her a visit on the 11th of March 2022, there was no power in her place of work. Apparently, a truck that was passing by accidentally hit power lines that were loosely connected a day before, causing a blackout in parts of the area. By 11.30 am, she had not even started preparing her chapatis, which she says are usually ready by noon. Customers came visiting her shop requesting chapatis only to be told to come later. Due to power interruptions, she was compelled to use firewood to boil her cereals, which took longer to be cooked and interfered with her day's program. After boiling her beans and green grams, she fried them in a KOKO cooker, which she bought when the prices of charcoal went up before she came to know about the EPCs. The KOKO cooker was also not very reliable as it was very slow, a lot of time went by before the beans, and green grams could be ready. In short, we witnessed first-hand how the lack of power messed up her day. Furthermore, loss of power forces her to go back to the traditional ways of cooking.

Batuli believes that her business has the potential to grow. However, what is restricting her at the moment is the fact that she only has one EPC. She says that if she had several inner pots, it would be easier for her to function as each pot would be limited to a specific dish and would not have to keep on transferring every meal to a different pot after cooking it.

She does not have an EPC at home since she prepares her meals at her place of work and carries them home.

### *Impact Story Case 11: Emily Bolo's Household*

*Figure 21: Emily Bolo. (Photo credit: Haron, ACTS)*

Nearly two years ago, Emily, a young researcher in the Modern Energy Cooking Services Program – Kenya Chapter, witnessed first-hand an event that revealed how the choices of cooking fuel could negatively impact the health of a household member. She lived in one of the estates in Nairobi and usually used LPG for most of our cooking needs with charcoal being used occasionally for meals requiring longer boiling times. This is a common practice in her neighbourhood in Nairobi, Kenya.

One Saturday, her immediate neighbour who had a daughter, chose to prepare dinner using LPG as usual. Little did she know that her cooking gas was almost running out and needed to be refilled. Before she could complete preparing the meals for her family dinner, she ran out of cooking gas and opted to use the charcoal stove because she did not have enough money to refill the LPG. It is a usual practice in most urban Kenyan households to use the charcoal stove outside the household for cooking, mostly the balconies.

*Figure 22: Cooking demonstration by Emily (ACTS) and Stella (KPLC) using an induction cooker at KPLC e-cooking Demo Centre (Photo credit: Paul Osogo, ACTS)*

Her good neighbour had a religious meeting to attend that evening. She trusted her fully-grown daughter in her 20th year with the household cooking. She quickly stepped out and allowed her daughter to continue with the evening dinner preparation outside the house. After completing the cooking event, the daughter decided to transfer the cookstove into the house to keep warm as she waited for her mom to come back before they enjoy dinner together. This was their culture as they keep each other company and catch up after a long day of different engagements. In the process of waiting, she fell asleep since her mother had taken longer than she expected. Upon her return, the neighbour found her daughter lying

unconscious, and she screamed for help. They had to come in as neighbours to help, but unfortunately, most people were clueless on what to do for first aid. Having some ideas about a possible inhalation of the poisonous emissions from the charcoal stove, she quickly went online and got some articles that gave her some clue on what to do to remedy carbon monoxide poisoning. Luckily enough, she regained her consciousness as they administered the receiving first aid.

The incident came back fresh to her mind when she recently learned of the e-cooking appliances. This was after joining the MECS program and having the very first experience through a couple of the Kenya Power and Lighting Company weekly demonstrations dubbed *Pika na Pawa*. The incident got her thinking, what if her neighbour could have been aware of electric cooking then and had any of the e-appliances like an induction cooker? Could all the harm that her daughter was exposed to have been avoided.

The MECS Kenyan Team base at ACTS joined by Dr. Jon Leary visited the e-cooking demonstration Centre, KPLC, on 7th February 2022. During the Demonstrations, she practically witnessed the very few units of electricity consumed to prepare specific meals. For example, only 0.687 units were used in the preparation of chicken stir-fry, which translates to around Ksh. 14 (1 unit = Ksh. 20). Considering that her neighbour did not have enough money to refill her gas when she needed it most, an induction cooker would have been her best option. She would have completed making her food within the shortest time possible and at a little cost. Her

daughter was lucky as she survived the ordeal. Many similar cases have been heard throughout the country where the victims never survived from the carbon monoxide poisoning.

## Kitui County

### *Impact Story Case 12: Joel Mwendwa's Household*

*Figure 23: Joel Mwendwa "Tukitumia hii jiko tutakuwa na miti mimgi kwa maana hakuna mtu atakuwa anazikata ili kutumia kama makaa." (Photo credit: Ruth, Gamos)*

Joel is a middle-aged man residing in Kitui County. He is part of the e-cooking project that was spearheaded by ACTS-MECS in partnership with CARITAS-Kitui.

Prior to receiving the EPC, Joel and his family mainly relied on biomass for their cooking needs and LPG. He mentioned the challenges he experienced with using LPG, "*gas ilikuwa inaisha haraka…sahi bei ya gas imepanda…refill ilikuwa lazima ufike Kitui town (the gas running out faster and the price of gas has* risen….besides you could only refill the gas cylinder at Kitui town and this was inconvenient for those who do not reside near the town." However, things changed for him when he received the EPC. He attested to the EPC's shorter time while cooking and less electricity consumed. Despite being a man, many of whom are often not associated with cooking; he is championing the clean cooking agenda in Kitui. He encourages all households that have not yet embraced the technology to try to get one EPC

for their home use owing to the multiple benefits associated with its use.

During the launch, Joel learned more about the functions of the EPCs, features he had never explored before. Through the help of the team from KPLC, ACTS, and GAMOS, Joel and other champions were amazed to discover that they could use the EPC while the lid is not closed. For the time that they had interacted with the EPCs, they had never explored the sauté function. They mainly used the EPC for heavy foods like cereals requiring longer boil times. Never once did they think that they could use the EPC to prepare meals like ugali, fry their vegetables, and even make tea among others. This realization filled them with excitement, and they acknowledged that they had been underutilizing the appliance despite its versatility.

To Joel, he is thrilled by the mere fact that he can prepare his Githeri with approximately 0.4 units, an equivalent of Ksh. 12/13. Githeri is one of the main dishes for many communities in Kenya. Moreover, he mentioned that many people are normally discouraged by the upfront cost of EPCs and urged them not to focus on the price, but the value associated with its use. He also stated that suppliers should ensure that they have schemes that enable even low-income earners to purchase EPCs.

He concluded by highlighting the need to conserve our environment by claiming that, "*once people stop relying on firewood and charcoal for their cooking needs, the status of the environment will improve*." Therefore, it will be easier to

attain the 10% tree cover recommended in Kenya since no one will be cutting down trees for firewood. Furthermore, the technology will play a great role in guaranteeing that toxic gases are not emitted into the atmosphere and, in the process; help address the problem of global warming.

Joel considers himself a clean cooking ambassador who underscores the use of clean and efficient technologies for cooking. "*With an EPC, you do not have to worry about your food getting burned. You can even leave your food while cooking and go and attend to some errands without having to be fearful,*" he says. Once the time allocated to cook a specific meal has elapsed, the EPC automatically shifts to standby mode, which can last up to 24 hours. Most importantly, he discourages using firewood and charcoal for cooking due to their harmful effects on the environment. To Joel, people tend to put so many barriers when talking about electric cooking, preventing them from seeing the good about e-cooking and the need to adopt the technology. He thus pointed out two things that people need to know about e-cooking:

i. The cost of electric consumption; Joel was involved in a baseline survey study that was conducted for 3 months to determine the number of units used to prepare the different types of local dishes in Ukambani. From the study, it emerged that the highest electricity consumption was 0.5 units used in the preparation of the Githeri dish, meaning that cooking with electricity, and in particular an EPC, does not consume a lot of electricity.

ii. The upfront cost; to Joel, despite the high upfront cost of an EPC, the amount one saves in terms of electric consumption in a year is much more than the amount needed to buy an EPC. It has value for money and as such, much focus ought not to be centered on its cost. Additionally, those with minimum wages can make use of their local chamas to procure the EPC on a rotational basis.

### *Impact Story Case 13: Betty Maingi's Household*

*Figure 24: Betty Maingi "kabla sijapata hii jiko, nilikuwa natumia makaa, kuni, na gas…lakini sasa maisha imekuwa rahisi na raha." (Photo credit: Ruth, Gamos)*

Betty is a middle-aged woman living in Kitui County. She is part of the champions who engaged in the research project in collaboration with CARITAS. Previously, she used charcoal for most of her cooking while supplementing it with firewood. She would use LPG occasionally whenever there was in need.

When she received an EPC last year, life became easy for her as the time she normally spent cooking was significantly reduced, leaving her with ample time to do other things.

Nevertheless, just like Joel, she underutilized her EPC as she only limited it to boiling her cereals. She was unaware she could use it to prepare other meals by clicking the sauté function. Besides, she states, "*I usually boiled my cereals first before frying them once cooked*." "*It is only through the launch today that I got to discover that one can directly fry their cereals with onions, tomatoes, and other ingredients without having to boil them first, provided they were soaked*," she added.

Initially, she was hesitant to use the EPC due to the myths surrounding its use. "*My daughters are still fearful and are not willing to try it out*," she stated. However, the launch presented a great opportunity for her that helped diminish her fears. Having to see several EPCs being displayed at once while different food items are being prepared with ease made her realize that it was a technology that she can depend on and use with confidence. She promises to share what she has learned with other women back at home to help create more awareness about the same. She also promises to maximize its use and urges those who have not procured one to do so.

## *Impact Story Case 14: Mary Katee's Household*

*Figure 25: Mary Katee "tangu nipate hii jiko, kazi nu kupress, kuweka, na kuenda." (Photo credit: Ruth, Gamos)*

Mary is a middle-aged woman living in Kitui as well as a clean cooking champion in the region. Before being issued with an EPC, she mostly depended on firewood use to prepare her meals, which she claims were costly. Besides, cooking was one activity she dreaded, maybe because of the process she had to go through before the actual cooking. Her worst days were when she had visitors and had to prepare different types of meals that would consume most of her time. The situation worsened when she had no one to help her with the cooking.

However, things became better for her the moment she started using an EPC. The appliance made cooking more fun and interesting, and she always looks forward to it. She says, "cooking with the EPC has brought lots of love in my home to the point that when I am not yet at home, my husband gladly takes over and does the cooking." She no longer has small disagreements at home with her daughter in law over cooking. She particularly thanked the MECS team for bringing the technology to them, which revolutionized their lives completely. Following suit as her champions, she urged the

participants who have not yet embraced the technology to get one for themselves.

### *Impact Story Case 15: Esther Mumo's Household*

*Figure 26: Esther Mumo (in between Joel and Betty) "kuni ni expensive, na ikon a kazi mingi kuipata." (Photo credit: Ruth, Gamos)*

Esther is a middle-aged woman residing in Kitui County. She is similarly a clean cooking champion in the region who is promoting the use of electric cooking. To Esther, the EPC has taken her life to another level, a life of comfort with no worries, not having to think where she will get her firewood. While she was relying on firewood, she used to get exhausted from having to cut and fetch the woods for her cooking. Alternatively, she had to hire someone to get her firewood, which was costly for her.

The EPC has thus changed everything for her. She can now do multiple chores simultaneously while cooking without being limited to the kitchen area. Cooking for her has become such a silent endeavour that her neighbours are left wondering if she no longer cooks, as there are no signs of smoke coming from her home. In addition, when using an EPC, no one can know what is cooking since all the vapour is retained within the pot. From her body language, one could see how happy she was with the technology. Wanting to be sure that all the present locals captured her sentiments; she shifted to using her native dialect.

## *Impact Story Case 16: Agnetor Mumbe's Household*

*Figure 27: Agnetor Mumbe narrates her experiences with EPC (Photo credit: Haron Akala, ACTS).*

Agnetor is a middle-aged woman and a clean cooking champion from Kitui County. She has interacted with the EPC for almost a year and narrates her experience with the technology.

Previously, she used 10kg of charcoal a month to cook Githeri. But with an EPC, she only uses 0.8 units of electricity to prepare Githeri that had not been presoaked to imply that fewer units would be used if the cereal were presoaked. Agnetor recalls that the last time she refilled her LPG was in December 2021, that she does not even know the retail price of refiling LPG at the moment.

Due to the convenience that comes with the use of an EPC, she uses it to prepare all her meals and incurs little cost in electricity. In a month, the average amount of money she uses to purchase her tokens ranges between Ksh. 500 and Ksh. 800 used for both lighting and cooking. Moreover, she attests that the EPC brought her closer to her husband. *"What I love about the EPC is the mere fact that I can cook even in the comfort of my sitting room while watching Television with my husband, something that has brought us closer. With time, my husband even began to gain some interest in cooking*," says Agnetor. It is thus a technology worth embracing considering the multiple benefits it has.

## Makueni County

### *Impact Story Case 17: Catherine's Household*

*Figure 28: Catherine shares her excitement after learning about the technology (Photo credit: Haron Akala, ACTS).*

Catherine is a middle-aged woman residing in Makueni County. She is a career woman and holds the position of the deputy head of department, Hospitality at Wote Technical Training Institute. Prior to the launch, she knew nothing about the EPC. She and her colleagues hence requested that the ACTS team visit the institute a day before the launch so that some of their teachers and students could be trained as the clean cooking champions in the region to better understand the technology before transmitting it to others within the region. That was done and the entire team that was trained quickly welcomed and embraced the technology. During the actual launch, they demonstrated the use of the appliance boldly and with confidence such that the participants were convinced about their effectiveness.

To Catherine, what she liked most about the EPC is centered on the fact that one can do different things at the same time while the food is being cooked. Besides, with the appliance, the issue of having to get late to work is addressed; something that implies that she will become much more effective at delivering her duties at work.

## *Impact Story Case 18: Benson Kimuyu's Household*

*Figure 29: Benson gives his story based on his short acquired interaction with EPCs (Photo credit: Haron Akala, ACTS).*

Benson is a middle-aged man residing and working in Makueni as the head of department Hospitality at Wote Technical Training Institute. Just like Catherine, Benson had never interacted with an EPC, was curious to know how it works, and if it is indeed effective in terms of the time used to prepare different dishes and the electric units spent. After a few demonstrations a day before the actual launch, Benson was surprised to see the limited time used to prepare and cook different food items at minimal cost when compared to other fuels. He appreciated the technology and underscored the fact that only a little water is used to prepare food items that normally require a longer boil time. This was especially important to him considering that Makueni County faces major water shortage issues. Water is scarce in the region and people usually have to buy water for use where a 20-liter gallon goes for Ksh. 25, money that could be channeled to purchase electric tokens and not incur additional costs in purchasing other fuels.

Benson mentioned that in his department, he has 562 students and 3 workshops that may not always accommodate all of them given that training is normally done twice a week. He likewise mentioned that he usually uses 135kg of gas every week for training thus spending Ksh. 35,000 on the same,

which is much more expensive when compared to using an EPC. To him, having to embrace the technology in his training is something worthwhile. "*I will no longer have to worry about the student population or the time it takes for one training session*," says Benson. On a regular day, the training classes normally take an hour for preps, 4 hours for the actual cooking, and an hour for service, all of which translates to 6 hours. However, with an EPC, the whole process will take at most one hour implying that they can have as many shifts as possible in a day and be left with ample time to engage in other activities. Benson concluded by stating that the technology has to be plugged into the mainstream, "*it is real, it is time-saving."* He will not be bothered about too many students being admitted into his department, as the technology will address the previous issue that he had on the time taken to practically train the students.

## Policy Implications – Why Does It Matter

The impacts of climate change are locally felt across sectors and communities and every action geared towards reducing greenhouse gases emissions is warranted. However, as the focus has been on mitigation for years, the local communities, socio-ecological systems and livelihood systems have to adjust appropriately to the changing climate to enhance resilience and ensure sustainability. Clean cooking technologies have been identified as a key area of not only mitigating against climate change by reducing the deforestation for biomass fuels but also reducing the emissions from the burning of such fuels. Furthermore, the modern energy cooking technologies have been identified and promoted as a viable adaption option as local communities adopt the new and clean cooking fuels s and technologies.

In Kenya, the ambitious target of achieving the universal access to clean cooking technologies by 2028 is only achievable by a combined stakeholders efforts and initiatives(SEforALL, 2021). The impact stories of clean cooking are thus an indication of the right path and the positive impacts the Modern Energy cooking services is having in Kenya to support the achievement of the universal access to clean cooking energy. In 2020, Kenya submitted its Updated Nationally Determined Contributions (NDC) committing to abate GHG emissions by 32% by 2030 relative to the BAU scenario of 143. MtCO2eq(NDC, 2020). This targeted NDC is only possible to achieve when a series of measures are taken to increase the forest coverage, reduce sectoral emissions but

also enhance the use of clean energy. The modern Energy cooking services is keen to support this process by promoting just energy transitions in Kenya in the clean cooking sector. The impact stories cross the Country is an indication of the progress and the impact s of the change and adoption of clean cooking technologies.

To hasten the steps towards clean cooking adoption in Kenya, the modern Energy Cooking services (MECS) have established regional cooking hubs in Kenya with its partners to enhance technology transfer services, rapid and easy market access, flexible financial mechanisms, promote local awareness and promote collaboration among the stakeholders. The County governments are working with the national governments to develop an integrated energy plan that has centrally placed clean coking adoption as a priority. The national government through the ministry of energy is already developing a national clean cooking strategy and a national electric cooking strategy to offer strategic guidance on clean cooking adoption. The strategies and the integrated energy plans will inform the necessary policies to be developed to enhance the clean cooking adoption agenda in Kenya and thus support the achievement of the Universal clean cooking energy access.

## Conclusion

The adoption of clean cooking technologies is gradually taking shape in Kenya. Thanks to the active role of the partners as championed by the MECS program. The impact stories present a few cases of real change and experiences of households already realizing and enjoying the transitions to clan cooking

methods. However, lots still need to be done to chieve the universal clean cooking energy access in Kenya. This story booklet is therefore a call for various actors in the clean cooking space to support the various initiatives and promote a mass transition to clean cooking technologies that will ultimately help in the reduction of greenhouse gas emissions, reduce the deforestations, and thus enhance the carbon sequestration.