

Cleaner Cooking in the Markets of Maputo

Improving the health and
working conditions of
cooked-food vendors
across the city

Responsible Team



GreenLight



survey of

430

cooked-food vendors in

32

markets across Maputo



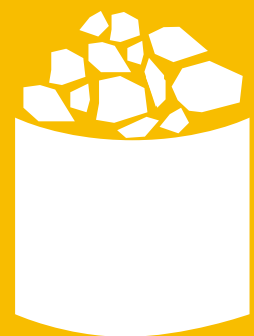
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In Maputo, as in cities throughout Africa, an enormous amount of commercial activity takes place far from the main streets and modern shopping centres in the many bustling informal marketplaces spread across the city. There are roughly 40 large market areas in Maputo, which are characterised by hurried, lively crowds, narrow passages and a network of tightly packed stalls either roofed with corrugated iron sheets or simply standing in the open air. One can purchase almost anything in these markets, from fruits, vegetables and everyday foods to traditional medicines, kitchen accessories, household furnishing, live animals and a growing supply of inexpensive manufactured goods, many of which are imported from China. Another common sight at the Maputo market places is the wide array of cooked-food stalls, providing hot meals and snacks to shoppers, workers and other

hungry passers-by. There are over 2000 officially registered cooked-food establishments in Maputo and many more remain unregistered. On average, each major market has around 30 food stalls, and each stall serves an estimated 50 customers each day. Most cook a variety of curries, meat stews, fried foods, and soups accompanied by side dishes of rice, maize porridge, pasta or fried potatoes. Cooked-food vendors are primarily female entrepreneurs; many work 10 hours a day or more, 6 days a week, all year round. Given the lack of space in most city markets cooking generally occurs indoors in badly ventilated makeshift kitchens. A survey of 430 cooked-food vendors in 32 markets across Maputo estimated that 96% use charcoal as their primary cooking fuel. The survey results show that, on average, each vendor uses 10.5 kg of charcoal per day, making them the largest per capita consumers of charcoal. The data also reveal that the



vendors' charcoal stoves are kept alight for an average of 8 hours per day in order to continuously cook food or keep it warm. Long hours spent over a charcoal stove in a poorly ventilated space pose a serious health risk to Maputo's cooked-food vendors. The massive amounts of charcoal required for cooking fuel, moreover, generates significant carbon emissions. And the wood required for charcoal production is a major contributor to deforestation.

Yet the human toll is the most immediate and compelling consequence of charcoal-burning stoves. Roughly 85% of Maputo's cooked-food vendors work in enclosed spaces; half suffer from chronic eye irritation; half report persistent headaches; and a third suffer from respiratory illnesses. All of these symptoms are strongly associated with the severe indoor air pollution caused by charcoal stoves. In order to improve the working conditions of cooked-food vendors, cut carbon emissions and stem the spread of deforestation, SNV is working in partnership with the Municipal Council of Maputo and CleanStar Mozambique on an

innovative solution: ethanol-fuelled cooking stoves.

CleanStar has pioneered the use of ethanol as an affordable, clean-burning alternative in the household fuel markets of Maputo and nearby Matola. This technology comes as a welcome change to many who formerly depended on charcoal. The current project is the first commercial-scale introduction of ethanol cooking fuel in Africa. In line with SNV's focus on sustainable development solutions, determining the economic feasibility of using ethanol stoves for professional cooking was a top priority.

The project began with 18 cooked-food vendors in three of Maputo's major city markets, who were selected to participate in the pilot phase. The vendors, who in the past had relied exclusively on charcoal, replaced this fuel with ethanol for a period of four weeks, after which they were given the option to purchase their stove at the market price.

The results were very promising. The vendors were deeply impressed with the new technology, described the ethanol stoves as safe, clean, smoke-free, easy to light, easy to

adjust, and convenient to use. The participants in the pilot phase were able to prepare almost all of their usual dishes using their ethanol stoves.

The efficiency gains of ethanol were immediately apparent. The faster-lighting, hotter-burning ethanol stoves cut cooking times for main dishes by over 30% compared to charcoal. In addition, participants no longer needed to keep charcoal fires burning all day in order to warm their food. Instead they were able to quickly heat-up orders when customers arrived. SNV estimates that this alone saved each vendor an average of 2.5kg of charcoal per day, or US\$ 1.5 dollars.

Overall, the participants consumed an average of 2.3 litres of ethanol per day. Each litre of ethanol replaces 4kg of charcoal, producing far cleaner indoor air and a considerable reduction in carbon output. In addition, as the charcoal-making process typically requires 9kg of wood for every 1kg of charcoal, each litre of ethanol replaces 16kg of wood; consequently, each ethanol stove represented a savings of nearly 37kg of wood per day.

Voices of the Market



Dona Filomena has run a small kitchen in the Museu market for 10 years. She employs two assistants, who help her cook for and serve around 25 customers each day. Dona Filomena has always used charcoal to prepare her food. She cooks indoors, typically using three charcoal stoves simultaneously: one for stew, one for rice, and a third to keep food warm. She frequently complains of the noxious smoke created by her charcoal stoves. When asked what she likes about cooking with a charcoal stove she replies, "Nothing, really. Using charcoal to cook makes a lot of smoke and dirt. I would like a stove that does not make smoke." During the pilot project Dona Filomena switched all her cooking to ethanol. She used an average of 2 litres of fuel per day for a total of 12 litres per week, supplanting the roughly 50kg of charcoal that her kitchen had previously burned every week.

“ The ethanol stove] is fast to light and quick to cook the food.”
I have nothing bad to say about it; for me this is an effective and efficient stove.”



“ The [ethanol] stove is fast and easy to use. When clients come, I can quickly light the stove and heat up food. There is no smoke and it does not dirty the pots.”

I like everything about it. There is nothing which I don't like.”

Dona Aida works at a food stall in Malhazine market. She has been working there for the past 2 years, cooking indoors with charcoal in a space with little ventilation. Dona Aida serves around 20 customers each day. She works 13 hours a day, 7 days a week. Each day her food stall burns 11kg of charcoal. She suffers from constant headaches and eye irritation. Since Dona Aida received her ethanol stove, she has stopped using charcoal almost entirely. She only uses charcoal to grill meat, or to cook rice in her larger pots. Dona Aida would prefer it if the ethanol stove were a little bigger, which would allow her to use it with her larger pots.



Dona Fatima owns a food stall in Xipamanini market, where she has been preparing meals for over 12 years. Dona Fatima serves around 30 customers each day. She works 10 hours a day, six days a week. Before she started using her ethanol stove Dona Fatima was satisfied with charcoal. She had become accustomed to it and believed that food tasted better cooked over charcoal, though she did admit that cooking with charcoal increased the room temperature to an uncomfortable and potentially unhealthy level.

Once she switched to ethanol, however, Dona Fatima immediately noticed its benefits. She now cooks most of her dishes with ethanol, with the exception of rice and maize porridge, for which she continues to use charcoal due to the larger pots the food is cooked in.

All of the other participants were similarly satisfied with their ethanol stoves, but the true measure of the project's success was shown in their willingness to buy the stoves from the project at the market price. The ladies who participated in the pilot continue to cook with ethanol and are encouraging their fellow cooked-food vendors to purchase the new stoves as well.

“The ethanol stove] is simple to use and efficient. The stove is also clean. However I most like that the stove does not heat up the room too much.”



During 2013 SNV and CleanStar will expand the project into other municipal markets in Maputo. The objective of this new phase will be to determine the market readiness of the current ethanol stove model and develop a broader plan for the rollout of this new technology. SNV and CleanStar will then formulate a Proof of Concept in order to leverage multi-stakeholder support for a wider intervention. The market for alternative cooking fuels for food vendors in Maputo alone is estimated at US\$3.2 million. Through this initiative SNV and CleanStar are working to expand access to a cleaner fuel alternative that will have direct health benefits for the thousands of women and children currently suffering from the indoor air pollution caused by charcoal. It will also contribute substantially to the reduction of deforestation, potentially saving as much as 239 tons of wood that are now harvested annually for charcoal production.

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