Project Gaia Nigeria

Pilot Study Activities Update
Delta State, Nigeria
9 April 2007

Pilot Study Sites

Asaba pilot study location--60 stoves

Abraka town and sub-location--45 stoves

Warri town and sub-location--45 stoves

Getting set to deploy stoves to study households around Delta State, 20 February 2007.

Fuelling the methanol stove:

The consumer need never to come into contact with methanol stove fuel.

The seven canisters in the following photo represent a full week's supply of alcohol fuel for the CleanCook stove. The seven canisters are purchased once each week, filled, from the certified fuel dealer. At the end of the week when empty they are traded in for re-filled canisters. A handy tote sack will be designed to carry the canisters.

The canisters when empty are very light weight. When filled with ethanol the weight of the total package will be scarcely more than 7 kg.

In this way the liquid methanol fuel is handled much like propane gas (also toxic), yet it is handled as a non-pressurized liquid bound up or *adsorbed* onto a special fiber rather than contained in a pressurized canister that can explode.

Once in the canister, the methanol will not spill or leak out but will only evaporate out. Prior to using, the canister is sealed with a thin, peel-able foil cover over the evaporative surface that prevents any loss of the fuel to evaporation before use.

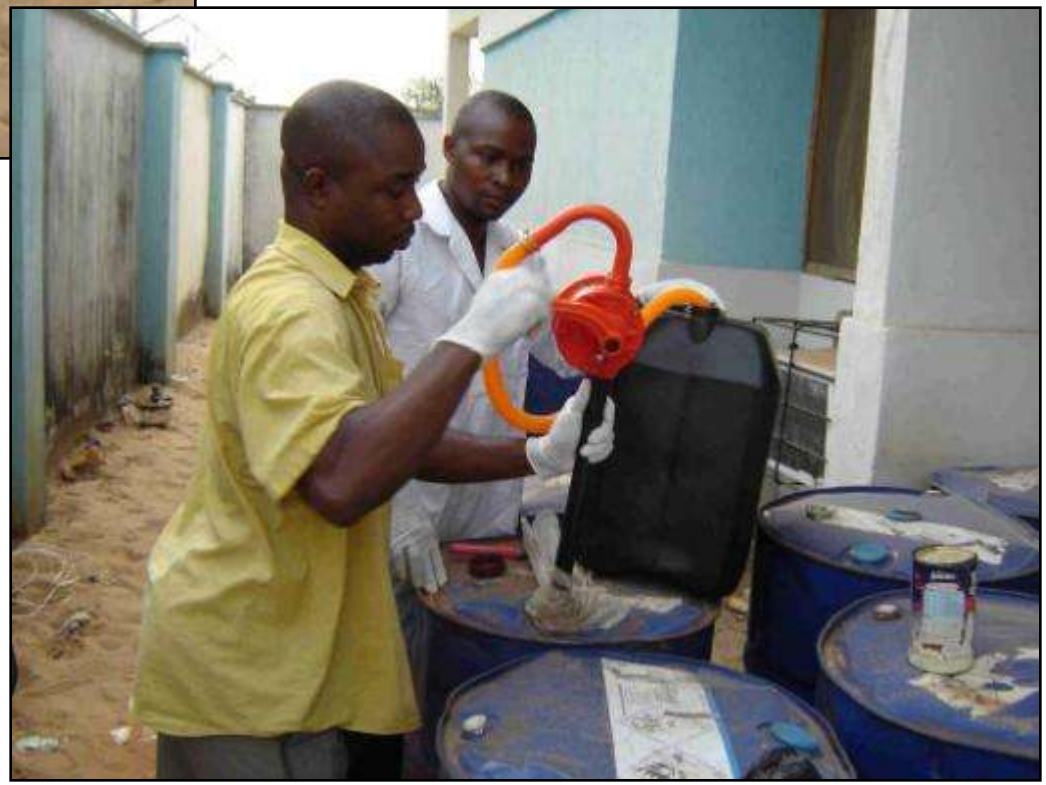

Model for methanol distribution in canisters being tested by Project Gaia in Delta State, Nigeria.

Project Gaia Surveyor Luscious taking the proper safety precautions for denaturing the methanol with blue dye and Bitrex, a very powerful bittering agent.

Methanol Distribution to Households

Every week, methanol fuel is delivered to the surveyors in 2 fifty liter jerry cans containing 100 liters of methanol from which they dispense into their working 10 liter jerry can to be carried along as they distribute fuel to the households. To ease the distribution of fuel, the surveyors were each given a graduated plastic jug into which methanol will be measured in 2.4 liters from the 10 liter jerry cans and poured into the 2 canisters in 1.2 liter measurements a piece.

Methanol stored in drums behind the Project Gaia field office in Asaba, Delta State, Nigeria



Project Gaia team members Chukuma (left) and Luscious transferring methanol from a drum to a jerry can.

Methanol goes from the blue drum into the jerry cans, and is then poured into the pitchers for refilling the stove canisters.

Loading denatured methanol into the truck for delivery to the surveyors.

Project Gaia Surveyor Ebele filling a canister in Warri to the delight of the primary cook, Ms. Enoh Ayomike.

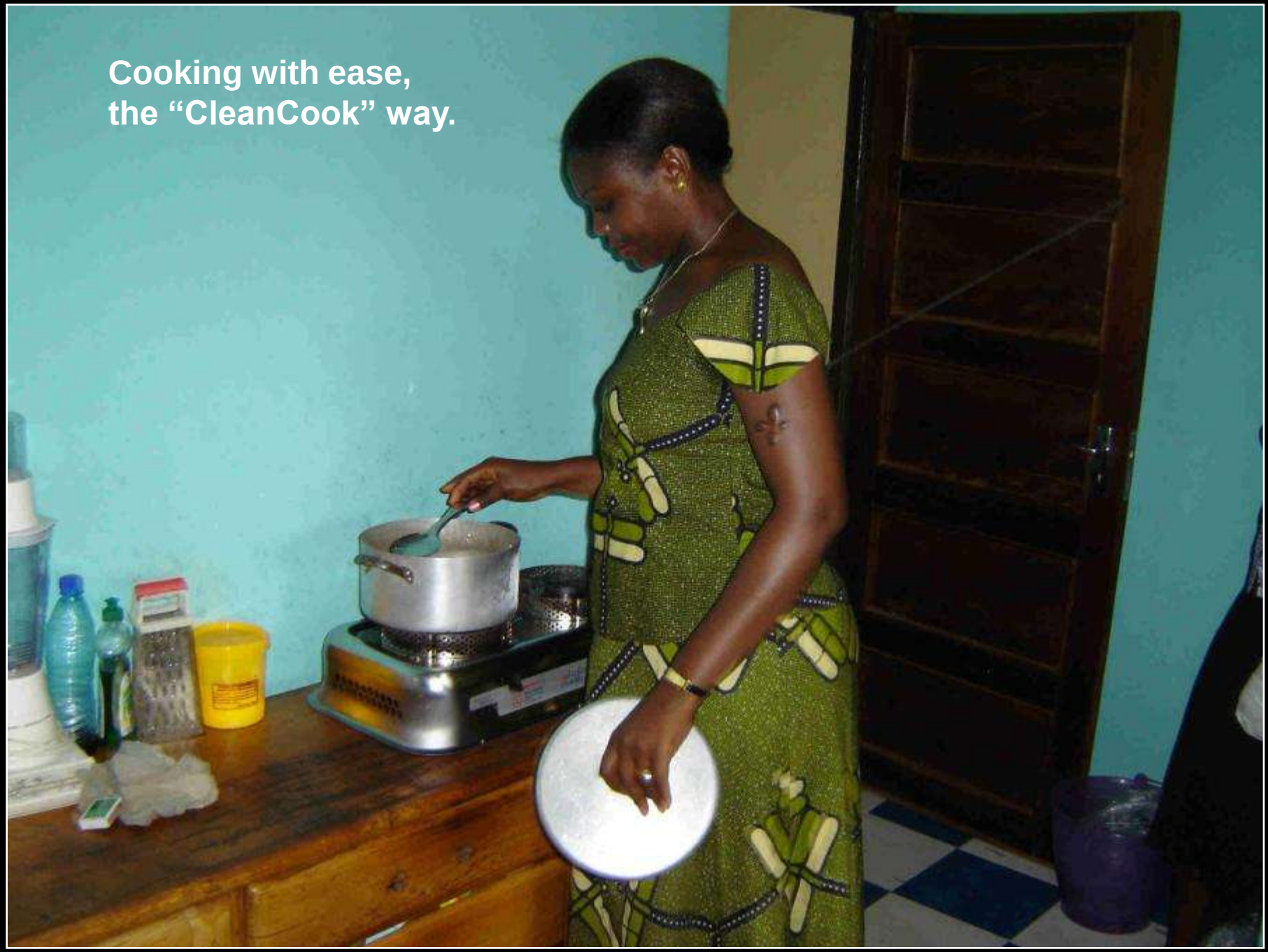
A family prepares to cook its first meal on the methanol-fueled CleanCook stove, Delta State, Nigeria.

Project Gaia Surveyor, Wosilot (right), meeting with pilot study participant Mrs. Ego Umanah in Asaba, Delta State.

Methanol Use Among Households

During Phase 1, methanol was provided free to study participants, with surveyors going daily to the households to refill the canisters. Most households were using about a liter/day to meet their cooking needs, having stopped using their other stoves, suggesting an average of about 6 liters/week to use the CleanCook stove.

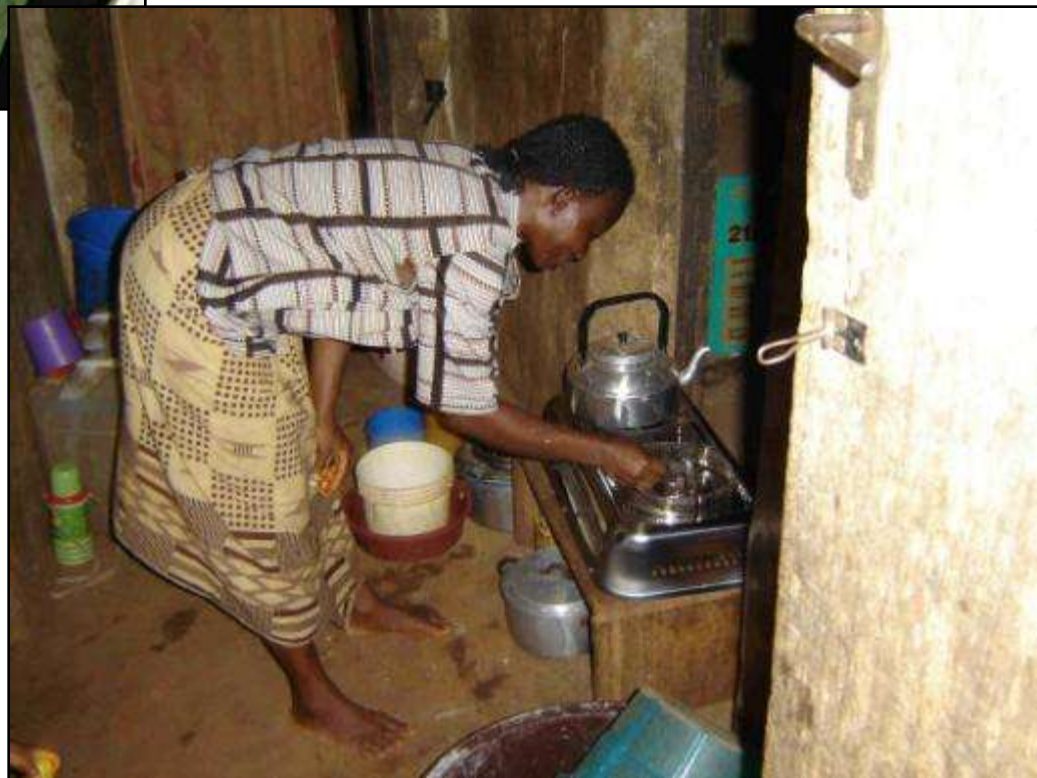
Phase 2 is under way now, with households paying N25.00/liter of methanol (US$ 0.21). Surprisingly, the households are purchasing more than the standard average-use of 6 liters/week. Reasons for doing so include: want to stock up for the Easter holiday when larger amounts of food are prepared, prefer cooking with the CleanCook stove, have stopped using kerosene and wood stoves.


Cooking with ease,
the “CleanCook” way.

Mrs. E. A. Uviovu, Ughelli town, Warri study location

"The stove has been wonderful, in fact, we don't have the problem of kerosene fumes anymore. The heat output is fine, in fact I have put my kerosene stove aside already as you can see. It is faster than the kerosene stove; it also cooks without getting your food burnt. It cooks clean and doesn't stain your pots and there is no smoke at all. My pots are now constantly clean. It has saved me so much money on the use of scouring powder, which I was using to remove soot stains from my pots when I was using the kerosene stove. You can see my pile of clean pots in the shelf behind you."

Surprised by how quickly the CleanCook stove warmed her kettle of water, Mrs. Agnes Gilala of Warri study location exclaims with regard to the speed it took the water to boil.



Mrs. Lucy Obiamah lights the CleanCook after receiving the day's methanol supply from Project Gaia Surveyor Helen in Ibusa, a sub-location under Asaba pilot location.

Comments from Mrs. Florence Egede

- ***"None of my household members has had eye irritation for the past one week that I have used the stove. This problem was a common occurrence when I was using kerosene stove; especially when I turn it off."***
- ***"I am satisfied with the heat output of the CleanCook stove; because my kitchen is no longer hot as it used to be when I was using my kerosene stove."***
- ***"This CleanCook stove is faster than the kerosene stove. It is better than the kerosene stove in every way".***
- ***"The CleanCook stove is clean; it does not darken pots and there's no smoke. It is actually a CleanCook stove!"***
- ***"There is no problem with the methanol fuel. I am not allowed to touch the fuel and you [the Project Gaia surveyor] are the only person that fills it for me."***
- ***Note: No photo appears because pilot study participant Mrs. Egede did not wish to have her photo taken.***

Mrs. Ejime Nwanze of Umunze Quaters in Ogwashi-Uku, Delta State cooking with the CleanCook stove. To her right is a cylindrical Chinese kerosene stove, which she purchased at the price of N3,800 (US$ 32.00) in June 2006. Note the thick layer of soot all around the kettle placed on the kerosene stove. She confirmed the kerosene stove started developing fault by November 2006; just 7 months after use. She said she had abandoned the kerosene stove for the CleanCook stove since she received it from Project Gaia for the pilot study.

Gas flare in a Niger Delta community near the pilot study site of Abraka. Captured flare gas can be easily converted to methanol, providing a locally procured and affordable cooking fuel to the people of Nigeria.

COOK STOVES BEING USED IN DELTA STATE, NIGERIA TODAY

Photo 1: Shows a locally fabricated pressurized kerosene stove. At the background is the fuel cylinder. To the far left is the air pump from which a pressure hose connects to the cylinder from where a second pressure hose runs to the burner, which is fitted with a nipple, conducting rod, vaporizer valve and perforated plate.

Photo 2: Shows the maker, Mr. Emeka Uchenna, pumping the cylinder with the air pump (extra accessory) to pressurize the cylinder. Interestingly enough, methanol, which is often packaged as methylated spirit, is used to prime the stove for it to ignite (this together with other accessories represent an added investment cost).

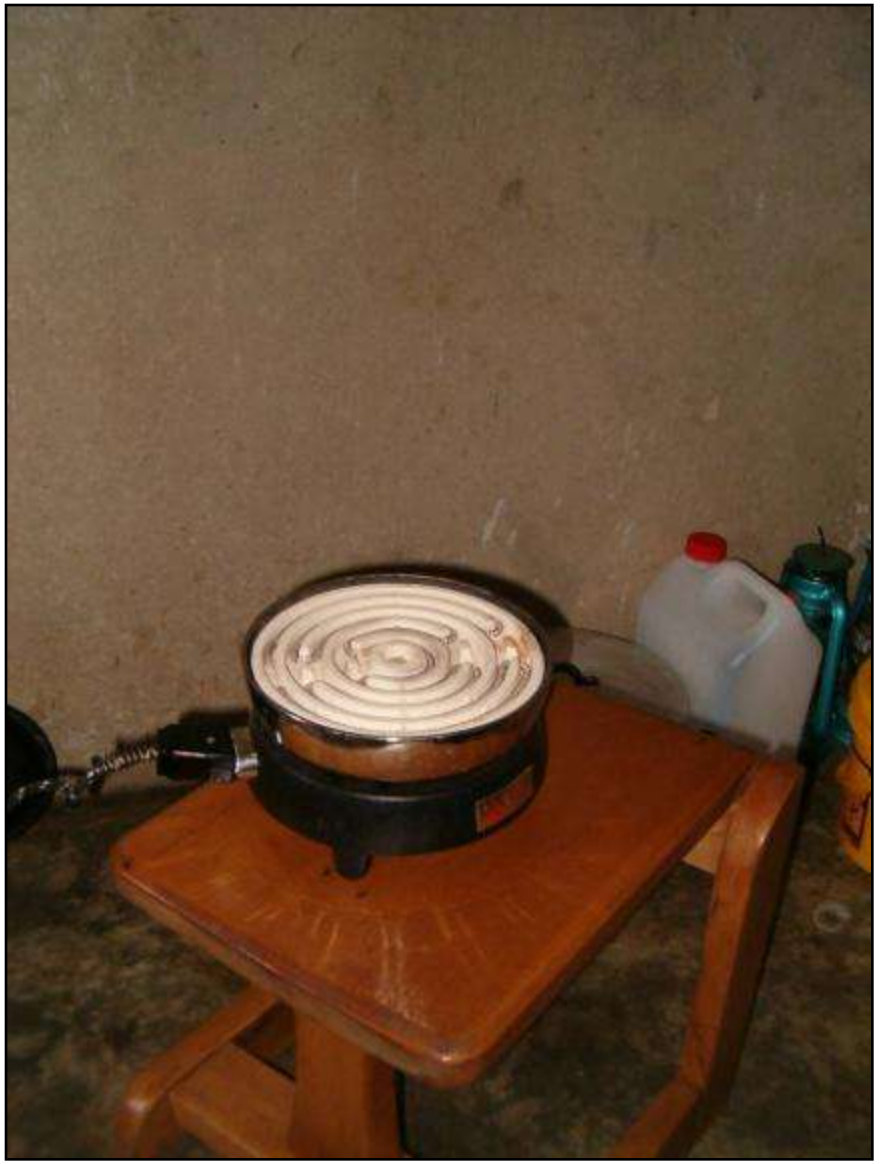
Photo 3: Shows the stove in operation. From the time it is pressurized with the aid of the air pump to the time the igniter is primed with alcohol and the time it took to ignite was 13 minutes. It burns with a visible yellow and sooty flame. At the background is a 4-litre jerry can containing the kerosene. A small bottle of methylated spirit is kept at all times. The flame did not immediately circulate round the perforated plate fixed to the burner after priming.

Photo 4: The stove and cylinder.

UNIT PRICE is N5,200 (US$ 44.00)

A Chinese two-burner stove used in a household before the introduction of the CleanCook stove. The kerosene stove was purchased for N5,200(US$ 44.00) in December 2006. The stove has caused a thick soot stain to form an outer layer on the pot used on the stove.

Pot support ring for wood fire.



Electric hot plate.

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