

TRANSFORMATIVE COOKING SOLUTIONS IN THE ASSOSA REFUGEE CAMPS OF ETHIOPIA



Our Story

4.3 million people die annually from indoor air pollution

More than 3 billion people cook their meals with solid fuels such as firewood and animal dung. That's almost half of the world's population. Women and children largely bear the burden of this, facing exposure to indoor and ambient air pollution as well as physical danger when collecting wood.

Clean cooking with alcohol fuels changes everything

At Project Gaia, we have found that alcohol fuels provide:

- o Safety
- o Efficiency, cost-effectiveness
- o Cleaner air
- o Economic Empowerment

How we tackle the energy crisis

We enable local commercial and humanitarian actors to establish sustainable cooking solutions for their communities by supporting their activities.



Cooking Challenges Refugees Face in the Assosa Camps of Ethiopia



For the past 13 years, Gaia Association has worked with refugee communities that face many challenges even for the most routine tasks, such as cooking their meals. These include:

- o Access to fuel for cooking, especially cleaner fuels
- o Health problems from exposure to air pollution, including respiratory infections, pneumonia, asthma and eye infections
- o Hours spent every day gathering firewood
- o Exposure to risk of violence and injury when walking long distances to collect firewood—especially for women and girls
- o Exposure to attacks from local communities that seek to protect their scarce firewood resources
- o Low school enrollment for children, especially girls, who must spend time helping their mothers gather firewood
- o Loss of income from livelihood activities as so much time is spent collecting firewood or lost to sickness



The problem: continued use of solid fuels—especially wood



The UNHCR buys wood at great cost for many camps. This is unsustainable and harmful to the refugees.
The UNHCR, Clean Cooking Alliance and GAIA are seeking to provide better solutions.



**The cost of buying this wood is better spent
on more sustainable solutions.**



Gaia has served as an Implementing Partner to the UNHCR for 13 years and has distributed over 10,000 ethanol CleanCook stoves, 3,000 briquette stoves and installed over 600 solar street lights and 500 solar home systems. We have also distributed improved combustion stoves and institutional stoves for school cooking. This collaboration has created opportunities for refugees to access more and cleaner energy and embrace economic opportunities.

In 2018, Project Gaia was awarded the Humanitarian Clean Cooking Fund grant by the Clean Cooking Alliance. This has allowed us to scale up ethanol and briquette cooking stoves and fuel in the Assosa camps, reaching more than 4,000 households. Refugee- and host-community-owned businesses are being set up to make or assemble stoves and make and deliver fuel.

ASSOSA CAMPS AT A GLANCE



Assosa is in the Benishangul-Gumuz Region

Overview and Achievements

- o 63,500 refugees as of September 2018
- o 5 camps total
- o While 87% of refugees still depend on firewood to meet their needs, we have shifted 13% so far to ethanol and briquettes
- o 2 stove projects run by Gaia Association in Tsore and Sherkole camps—ethanol and locally made briquettes
- o A cash voucher system to allow refugees to purchase stoves and clean fuel
- o Business associations set up and operated by the refugees and host community

Ethanol stove: very clean, works well indoors



Briquette stove: cleaner than firewood, use in open air



Our two solutions: Ethanol and Char-Briquette Stoves



Project 1:
Ethanol
CleanCook
stoves



Ethanol Stove Assembly and Empowerment Training

For the past 13 years, Project Gaia and the Gaia Association have worked with both civil society and refugee communities in Ethiopia. Refugees in particular face many challenges to survive and stay healthy in camps where they have sought refuge.

Project Gaia focuses on clean energy and livelihoods. We believe that Ethiopia and even the refugees, despite their resource-constrained settings, can secure a measure of energy independence by moving to more sustainable solutions.

We work with our clients to empower them so that their achievements and what they gain from them will be their own.

This strategy benefits the world at large. Sustainable energy is low-carbon energy, which helps to address climate change—an urgent and growing concern.



Refugee workers are assembling stoves, which they will sell to members of their community

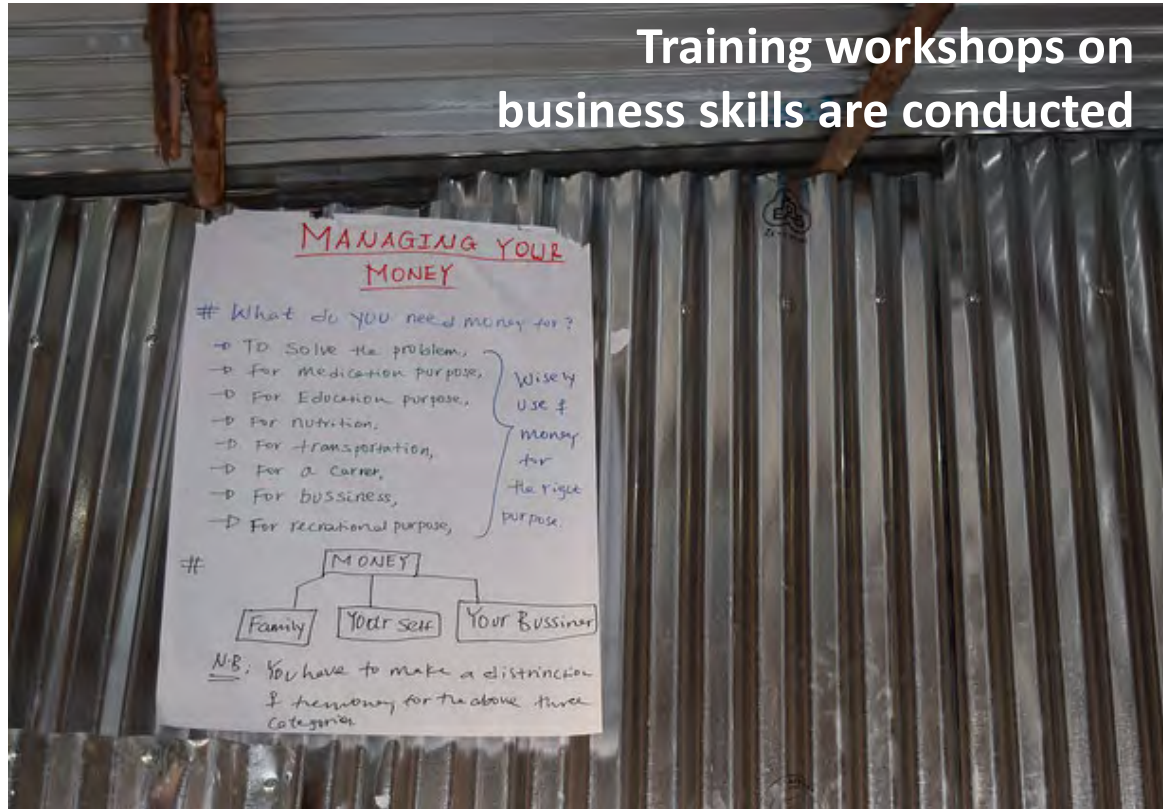


The project creates livelihoods for refugees all along the value chain, namely:

- o Assembly of stoves
- o Managing the fuel
- o Stove and fuel sales
- o Keeping of accounts
- o Maintenance of stoves

It is a model of economic empowerment for both female and male refugees. In addition to economic benefits, refugees are given practical training to help develop skills for success.

Refugees are also given empowerment training on managing finances as well as building their self-confidence



Ethanol is trucked from Finchaa Sugar Factory to the Assosa Camps, where it is stored in tanks, as in this 45,000-liter tank in Sherkole Camp. It is sold to households in 10-liter jerry cans from small stores in the camp.



Ethanol is carried 540 km by tanker truck to Sherkole Camp. 45,000 liters can be transported per trip. Liquid fuels are an efficient way to transport energy, because they are more energy dense by volume than gaseous fuels or stacked wood.





Storage of
the locally
assembled
ethanol
stoves with
jerry cans
and pitchers.

Ready for
sale.

Project 2: Char- Briquette stoves

- o There is demand in the camps for 15,000 tons of briquettes per year
- o 4,000 briquette stoves are currently being manufactured by the refugee workers
- o Production takes place in 3 camps





Briquette stove manufacture

Locally made
char-
briquette
stoves in
inventory.

Ready for
sale.



The briquette-making process starts with the feedstock. These are seasonal grasses, which must be controlled to prevent wildfires. The grass is harvested.



The grass is carbonized.



Finished char-briquettes



The grass is carbonized in a kiln and turned into mostly pure carbon. This is done by burning the grass in the absence of air. The smoke-producing substances are consumed. The carbon remains for cleaner burning in a household stove.

Once the material inside the kiln has been reduced to carbon, it is removed for more processing



Emptying the kiln



The carbonized material is mixed with a binder, then briquettes are stamped out with a hand tool.



The fresh briquettes are put on a rack to dry.

The briquette-making team





Briquettes are dried and stored under cover, ready for sale. They are made mostly during harvest season. Inset: a burning briquette.



Once lit, char-briquette stoves burn cleanly but do produce CO. Some smoke is produced when the stove is lit.



Once fully engaged, the briquette burns well.



The smoke is produced mostly from the grass being used to light the fire.

Project 2a: *Extruded Briquettes*



In addition to manual briquetting, GAIA has installed an extruder to make briquettes. This machine compresses finely ground biomass and turns this material into a log, which is carbonized in the kilns, broken into pieces and used in the stove like charcoal.



The extrusion process produces heat and fuses the sawdust into logs.



Sawdust and other fine materials are used.



The kilns are built in a factory in Addis Ababa.

The kilns are delivered to the camps by truck.



A photograph showing several large, cylindrical metal kilns installed in an outdoor area. In the foreground, there are two large, dark, rusted metal kilns. To the right, there are three newer, silver-colored metal kilns. The kiln closest to the camera has a red number '6' painted on its top. Behind the kilns is a fence made of woven bamboo or reeds. In the background, there are trees and a building with a corrugated metal roof. Two people are standing near the fence in the distance. The ground is dry and dusty.

**New kilns installed in
Tsore Camp**

The Sherkole and Tsore Refugee Camp Business Associations and their plan for doing business

The business associations were established in 2018 by refugees and local host community members. Initially they have been formed in two camps, Sherkole and Tsore. They are composed of approximately 70% refugees and 30% host community members. Each association has 20 members, 12 women and 8 men. This is a unique effort that integrates the refugee and host communities in productive activities from which they can develop businesses and livelihoods.

The total number of refugee households in Sherkole and Tsore is 6,000. The local community has 3,000 households. The program hopes to achieve at least 80% coverage or 7,200 households. Two thousand households are already being served. Once the remaining 5,200 households are reached, the program will expand to the three remaining Assosa camps.

The main business activities of the associations are:

- ✓ Ethanol stove assembly and sales
- ✓ Ethanol fuel sales
- ✓ Briquette production from waste or low-grade biomass resources (Savannah grass, corn cobs, other agricultural residues)
- ✓ Briquette stove manufacturing
- ✓ Briquette fuel sales
- ✓ *In the near future*: carbon credit sales through Project Gaia. The ethanol stoves generate 4 to 6 tons of CO₂-e annually per stove. CDM and Gold Standard programs are in place; only verification of sales is needed.

With the help of the HCCF, a total investment of \$200,000 has been made to establish the ethanol and briquette stove workshops, the briquette production equipment, the storage tank for ethanol fuel, the importation of stove parts and raw materials, such as sheet metal, and the purchase of needed items for the supply chain. A portion of this initial investment has been allocated for working capital.



One of the dividends of this project is the cooperation established between host community and the refugees. Feedstock production and procurement and feedstock supply chain are the responsibility of the host community. It supplies ethanol fuel and supplies the grassy feedstock for briquette making. Working and doing business together promotes harmony.

Summary of Business Opportunity:

Briquette production: at full capacity, the briquette plants have a daily capacity of 1,400 kg.

Briquette production cost is ETB 3.20/kg (~\$0.12). Current selling price is ETB 4.5 (~\$0.16).

In 2019, the several briquette plants will produce and sell 336,000 kg of briquettes, for a net profit of around ETB 436,800 (\$16,000) for the associations.

In 2019, ethanol fuel sales are forecast to be at least 550,000 liters. The cost of ethanol with delivery and handling is ETB 12.58/liter and is sold at ETB 14/liter. This provides a margin of ETB 1.42/liter. The associations are expected to make a profit from the ethanol of 781,000 (\$27,850) in 2019.

Stoves are sold below cost. The main business of the associations is fuel sales.

Production/assembly of stoves creates income for the workers producing them. Ethanol stoves cost the project about \$28 and briquette stoves cost about \$8. **The more stoves sold, the higher the revenue from the sale of fuel and carbon credits.**



UNHCR Cash-based assistance:

In 2018, the UNHCR launched cash-based assistance for 1,000 families as tradable vouchers. These vouchers increase the refugees' purchasing power.

The cash vouchers are prepared by the UNHCR and distributed by Gaia Association to eligible households to enable them to pay for their monthly fuel needs. They buy from the Refugee Association. The Association converts the vouchers to cash in order to do business, e.g., buy more stoves and fuel and cover their operating expenses.

For now, the stoves are sold below cost, with help from donors. Once carbon credits are sold, this will close the gap between what refugees can pay and what the stoves cost.

In 2019 UNHCR is expected to increase the number of cash vouchers in use, and increase the number of families who become eligible.



Ethiopia opens wide window of opportunities for refugees

<https://africandailyvoice.com/en/2019/01/20/ethiopia-opens-wide-window-opportunities-refugees/>



Jan 19, 2019

Addis Ababa, Ethiopia

Ethiopia has enacted a new law allowing refugees to obtain work permits, access primary education, obtain drivers' licenses, legally register life events such as births and marriages and open access to national financial services, such as banking.

Ethiopia's parliament adopted revisions in its existing refugee law on Thursday, 17 January 2019, making it one of the most progressive refugee policies in Africa.



Ethiopia's Prime Minister, Abiy Ahmed. Photo: REUTERS

May we close with a request . . .

Every \$25 invested will purchase an ethanol or briquette stove for a family that otherwise could not afford one.

As you see, this is a worthwhile investment. Access to clean energy is one of the most powerful tools to empower women and enable children to be healthy and go to school. A good stove using a clean, affordable fuel saves women hundreds of hours otherwise spent collecting and managing firewood and cooking over a dirty, smoky fire.

<http://projectgaia.com/donate/>



To our donors who have helped us to add stoves to this program:



Thank you from our clients and beneficiaries!



*And thank you
from Project Gaia,
the Gaia Association
& the organizations
with which we work.*

