

UNHCR Kebrebeyah Camp Report

Preparing for Scale up of Stoves and Ethanol

June 2006

**Compiled by Fiona Lambe, Project Gaia Research Studies
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Introduction

In 2005, Project Gaia introduced 130 CleanCook (CC) stoves to Kebrebeyah refugee camp, for the purpose of a three month pilot study. These stoves were placed in homes in the camp and the selected households were supplied with one 10-liter Gerry can of ethanol every 10 days during the study. The progress of these households was closely monitored by Project Gaia staff throughout the testing period and the study was conducted with the assistance and cooperation of the UNHCR and ARRA (Administration for Refugee and Returnee Affairs, FRDE).

The outcome of this initial study was extremely favorable. Data show that the introduction of the stove greatly reduced the need for fuelwood, up to 100% in some cases. This has had a far-reaching impact on the lives of refugee women and their families, as well as on the surrounding environment. Women and girls no longer need to leave the camp to collect fuelwood. This has significant implications for their time, health and safety and livelihoods. Respondents reported using the time saved from gathering fuel for other more productive activities, such as education, income generation and childcare. Women and girls feel safer knowing that they no longer have to leave the camp for gathering firewood, a laborious and dangerous activity. Moreover, the introduction of the CC stove has removed the smoke from refugees' kitchens and, consequently, has led to a vast improvement in the quality of indoor air and in household health.

Based on these positive findings and on a similar successful pilot study conducted at UNHCR-run Shimelba refugee camp, in northern Ethiopia, a partnership has been formed between the Gaia Association, an Ethiopian non-profit organization, and the UNHCR-RLO, Ethiopia, and a contractual agreement has been undertaken to scale up the number of stoves at Kebrebeyah camp. Under this contract, Project Gaia (the Gaia Association) will increase the number of stoves to Kebrebeyah camp by 500 by the end of 2006. Project Gaia will incur 46% of the cost of the scale up and UNHCR will incur 54% of the cost. If successful, this contract will be renewed in the future. The initial scale up will involve the placement of the first 300 new stoves into the camp in the coming weeks.

Background to the June Trip

Preparations are now underway for the scale up and the Gaia Association is making the various arrangements necessary for the expansion at Kebrebeyah. For the scale up to go beyond the pilot study phase and be truly sustainable, several factors must be carefully considered. Crucially, a suitable fuel distribution system must be arranged at the camp. Three hundred households must be selected and trained and a core staff of supervisors at the camp is needed to manage the distribution and monitoring of stoves and fuel to homes. Some facets of the survey data gathered during the previous 130-stove study were unreliable for various reasons and further household survey work on these homes is planned. In addition, careful monitoring and documentation of indoor air pollution levels for households at the camp, using equipment and protocols developed by the University of California at Berkeley, will also take place.

On June 15, 2006, a team from Project Gaia traveled to Kebrebeyah refugee camp to make the final preparations for the scale up. This team included Milkyas Debebe, Gaia Association Assistant Manager, Firehiwot Mengesha, Technical Analyst, Todd Wofchuck, IAP expert, Kate Lambe, Photographer and Fiona Lambe, Project Consultant. The Gaia team was accompanied by two staff from The Ethiopian Rural Energy Development and Promotion Center, Ephrem Hassen and Ahmed Ismael, who provided survey and technical support in the field. The Ethiopian Rural Energy Center is an agency in the Ministry of Mines and Energy, FDRE.

The team arrived in Jijiga on the morning of June 15, and was met by a UNHCR car, which transported them to the Jijiga field office. There they were greeted by Robert Larsson, Program officer for Kebrebeyah camp and Abdusemed Mohammed, UNHCR Assistant Program Officer. The Gaia team briefed the UNHCR office on the planned activities and it was agreed they would travel to the camp that day to meet with ARRA to set up all activities. After lunch, the Gaia team met with the Rural Energy staff and together they traveled to Kebrebeyah camp.

Upon arriving at the camp, the team installed the IAP equipment in 6 homes and photographed this process. Following a short meeting with ARRA, four surveyors were selected to assist Rural Energy and three translators, a supervisor and assistant supervisor were selected for the Gaia team. ARRA provided the team with a list of 300 selected households and instructed the translators to inform the primary cooks of these households of

the training sessions. It was agreed that the team would lead the training of the households, beginning the following day, in groups of 40.

The Gaia Team agreed to meet with Rural Energy the following morning (June 16) and travel to the camp where they would meet the translators and surveyors and begin work.

Allocation of Tasks

- **Household Selection and Training:** Fiona Lambe and Milkyas Debebe
- **IAP Monitoring:** Todd Wofchuck, Firehiwot Mengesha, Kate Lambe
- **Recruitment of Staff:** Fiona Lambe and Milkyas Debebe
- **Survey Work:** Ephrem Hassen and Ahmed Ismail (Rural Energy)
- **Inspection of fuel storage tanker:** Firehiwot Mengesha
- **Photographic Documentation:** Kate Lambe

Tasks Undertaken June 16-17

1. Household selection and training

On the morning of June, 16, the team met with translators Mahamoud Mahamed, Mahamed Mahamoud, Ferhiya Abdurahman Abdi, supervisor, Deka Hussen Moge, and assistant supervisor, Faisal Hasses Aden, at the IRC compound meeting hall, which was to be the venue for the training. Some refugees were gathered outside and within 30 minutes a full group was assembled in the meeting hall. However, it was necessary to register every refugee to ensure they were on the list of selected households provided by ARRA and this process delayed the beginning of the training.

Once every refugee was registered, the training began. The Gaia team welcomed the group, introduced the project, and described the planned scale up; they then gave a stove use and safety demonstration. Following the demonstration, households had an opportunity to ask questions. (The same question cropped up in every session: “How can we be sure the ethanol supply will be consistent”?) At the end of the session, a volunteer from the audience was asked to demonstrate filling and lighting the stove. This was repeated in every session and proved to be a valuable element of the training as it involved the entire group “correcting” the volunteer on what she was doing wrong.

Two more sessions followed on the same day but as the translators had not informed enough households to come, the training ended earlier than expected. The translators were told to inform as many people as possible and have them ready to begin at 9:00 am the following day.



Woman with baby strapped to her side demonstrating stove use

On Saturday, June 17, the team met the translators at the IRC compound where they had assembled a large group of refugee women. The training, which followed the same format as the previous day, began immediately and continued until lunchtime. By this time, approximately 270 households had been trained. In total, 30 households were absent from the training sessions, so it was decided to conduct one final session after lunch. However, most of these households had not been informed of the selection so the translators were asked to recruit new households to make up the difference. A final training session involving 30 households was conducted in the afternoon.

Problems Encountered:

Delays: Informing households of the training sessions and selection process, registering refugees for training sessions.

Confusion: Some new arrivals to the camp were under the impression that we were registering refugees at the IRC compound.

Outcomes: 300 Households were trained on stove and fuel handling and safety.

2. IAP Monitoring

(Compiled by Todd Wofchuck, Head of IAP Program)

We had a total of six homes that participated in the IAP study in Kebribeyah. The committee head of Zone 4 selected the homes. We launched the devices Wednesday, June 14 and successfully placed them on Thursday, June 15. The test was for a 48 hour period; thus, we collected them on Saturday, June 17, in the afternoon. There were no complications with the equipment. The participants went out of their way to protect the equipment and make sure there were no interferences during the 48 hour test period.

Problems Encountered: The challenges that we faced were that the houses were not pre-selected. ARRA had no idea of our study. We were lucky enough to have a committee member from Zone 4 to direct us to the six households. Once we arrived he would explain the study and that the equipment should not be disturbed. In the future these houses need to be confirmed and the participants made aware of the expectations of the study.

The Post Monitoring Questionnaire survey needs to be modified for the camps. The current questions do not reflect the conditions of the target population. It was very difficult for the participants to understand the questions. In the following week the team will create a new survey and send it to Dr. David Pennise at Berkeley for his review.



IAP equipment installed in home

Outcomes: IAP data (CO and PM levels) were gathered for six homes in Kebrebeyah camp. The information will be downloaded and added to the Database. The information will then be

sent to Dr. Pennise for analysis. The team will be performing this task. A member of the Gaia staff, Ms. Firehiwot Mengesha, will be very involved in the IAP program. The next step is to introduce her to Dr. Pennise so she can directly communicate with him on the scientific aspects of the IAP program. Ms. Firehiwot is a degreed chemical engineer.

3. Recruitment of Staff

The Gaia team requested that ARRA select candidates from among the refugee community to manage the distribution and monitoring of stoves and ethanol throughout the scale-up process. On the morning of June 17, the team met with the chosen candidates and briefed them on the project and their responsibilities. In total three staff were selected by ARRA.

They are, from right to left:

Deka Hussen Moge (Supervisor)
Faisal Hassen Aden (Assistant Supervisor)
Mahamoud Mahamed (Assistant Supervisor)
Mahamed Mahamoud (Bottler)



The staff participated in the training sessions and became well versed on the stove and the project. During the training sessions, it became apparent that one of the translators, Mahmoud, was particularly motivated and interested in the project. Moreover, his English was excellent and he grasped every aspect of the project quickly. For these reasons, the team decided to hire him as an additional assistant supervisor. On the evening of June 17, the new staff, including Mahmoud, signed their contracts with the Gaia Association. The contracts are for a six month period, beginning when the stoves and ethanol arrive at the camp.

Problems Encountered: None

Outcomes: Four key staff were hired to manage the scale up of stoves and ethanol at the camp.

4. Survey Work

Rural Energy staff, with the assistance of four surveyors, began their survey work on the morning of June 16. The surveyors were given training and asked to gather the selected 40 households (from the original 130 pilot homes) at the main ARRA compound to administer the surveys. The survey work began in the morning and due to delays, continued until lunchtime on June 17. In addition to the survey work, the Rural Energy staff gathered data on fuelwood gathering. Bundles of firewood were weighed to calculate an average weight and information regarding time spent gathering and distances traveled was collected. Rural Energy, with the assistance of the Gaia team, went on to conduct a focus group involving 10 key respondents (women) in a private home in the camp.



Ephrem Hassan (Rural Energy) weighing a bundle of fuelwood

Problems Encountered:

Competence of Surveyors: Some difficulties with the general level of English of the surveyors were encountered. One of the surveyors could not understand the survey or how to conduct it. Despite much coaching and support from Rural Energy, this surveyor was eventually dismissed and his remaining work distributed among the other three.

Outcomes:

A sample of 40 homes was surveyed and a focus group of 10 key respondents was conducted. Data was gathered on fuelwood weights and fuelwood gathering times and distances.

5. Inspection of Fuel Storage Tanker

(Compiled by Firehiwot Mengesha, Technical Analyst)

We have inspected the tanker that is located at the ARRA compound, Kebrebeyah. It is owned by UNHCR and the capacity of the tanker is around 14,000 liters and its physical appearance is good but it has small damages at two sides of the tanker. The shape of the tanker is cylindrical and spherical at both ends as shown on the pictures below:

It has a T shaped valve at one end, one small safety opening at the top and it has stands at the bottom of the tank. Even though the ladder is broken at one end it is attached at the other end. It has also two partitions inside the tank but the fluid will be mixed at the bottom. The tanker used to belong to a truck (Calabrese) for transportation of other fuels.



Front view of the tanker

I have taken samples from the bottom of the tank, and I have found a residue, which looks like a diesel oil. I recommend that the tanker should be cleaned with hot water and diluted caustic soda so that the ethanol won't have any impurity on future use. The person who is going to clean the tanker should be given strong instruction to clean out the oily part inside the tanker. The cleaning person can go down to the bottom by using ladder opening of the safety valve at the top.

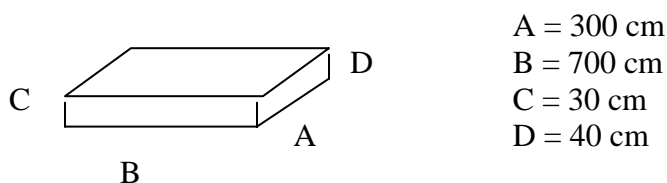
The tanker was filled with water to check the existence of any leakage but there was nothing on any part of the tanker. So, it is promising for ethanol storage if it is cleaned properly.

The ladder should be welded to allow for future appropriate use, and the small damages at the two sides of the tanker should be repaired. The tanker has a valve that can be used for ethanol distribution for future use.

It needs reducer valves for our appropriate use and locking for safety. Below are listed different types of reducible valves in the market including their prices:

Type	Price
3 in reduced to ¾	35ETB
Rube net ¾	22ETB
3 in to 4 red	45Etb
Total	102ETB

For distribution of ethanol from the tanker to smaller plastics by using reducible valves, we need gravity system. In addition to that, we need inclined concrete surface (cement, sand and stone) with dimensions given below:



For unloading of ethanol from the delivery truck to the storage tanker we have to use a pump. My assessment is as follows:

Diameters	Consumed fuel type	Price (ETB)
2 inch	Benzene	2400
3 inch	Benzene	3100
2 inch	Diesel	3500

From the above pump we can use 2 in. or 3 in. diameter pump with another reducible valve.

6. Photographic Documentation

(Compiled by Kate Lambe, Photographer)

Kate Lambe joined the Gaia team on the Kebrebeyah trip for the purpose of photo-documenting the installation of the IAP equipment, the Rural Energy survey work, households using our stove and the general living conditions in the camp.

In the afternoon of June 16, Kate Lambe accompanied the team to the six households selected for IAP monitoring. Photographs were taken of the team installing the equipment in each of the homes.

On the morning of June 17, Ms. Lambe, accompanied by a fellow team member and the translator, entered the camp to take photographs in people's homes, focusing on households

using the CC stove. Approximately 10 homes were included and photos were taken of people using the stove. More general photos were taken of the camp and of the outside of people's homes.

In the afternoon, Ms. Lambe photographed the household training session at the IRC compound. On the same afternoon, she assisted Rural Energy by documenting the focus group that was conducted in the camp.

Problems Encountered:

The greatest challenge was the crowds of curious children that gathered and followed the photographer wherever she went. This made it particularly difficult to set up shots, carefully frame pictures and spend time considering lighting, etc. By the time a shot was ready, crowds of children were in the way. This meant that, particularly outside of refugees' homes, shots had to be hastily arranged with the result that some photographs were out of focus, not properly balanced or overexposed. To compensate for this, Ms. Lambe took many more photos than needed with the intention of selecting the highest quality shots for use.

The time restrictions for the installation of the IAP equipment meant that the photo documentation of this process was not as comprehensive as had been hoped, especially given the poor lighting conditions inside the homes.

The translator that accompanied the photographer to the field on June 16 spoke very little English and thus could not properly explain to the households why she was there.

An additional concern, the translator brought Ms. Lambe and the other team member back from the homes to the ARRA compound by foot, a route which took them directly through the main entrance of the camp where hundreds of newly arrived refugees were gathered. The refugees, assuming that they were UNHCR staff, crowded around them demanding food and blankets. They managed to push their way through to the ARRA compound. This was a potentially very dangerous situation for the Gaia staff, particularly given the current tense situation at the camp caused by an influx of new refugees due to the recent instability in Somalia. The Gaia team had learned upon arrival at the UNHCR field office in Jijiga that violent riots had taken place at the camp as recently as one week previously and that the security situation had been heightened. There should have been a UNHCR car available to take the Gaia team members safely to the ARRA compound but unfortunately one was not available at this time.

Summary

All of the objectives established for the trip to Kebribeyah June 15-18 were met. These were:

- The selection and training of 300 households
- IAP monitoring of six homes
- Recruitment of staff at the camp
- Survey work: 40 households and a focus group
- Inspection of fuel storage tanker
- Photographic documentation of all activities

Next Steps

All the necessary preparations have now been made for the planned scale up of stoves and ethanol to Kebrebeyah refugee camp. The tanker is being prepared for fuel storage and until it is ready, the Gaia Association plans to deliver ethanol to the camp in plastic barrels (For safety reasons, steel drums are not feasible for the transportation of ethanol long distance). Approximately 130 new and 170 used but cleaned two-burner stoves are ready for immediate delivery to the camp. Dr. Amare G/Egziabher has approved sending both used and new stoves in one shipment; it is cost effective and demonstrates to ARRA and the UNHCR headquarters that implementation of the project has begun. The used stoves were employed in the Shell Foundation-sponsored pilot study in Addis Ababa and, after cleaning, are now being allocated to the Kebrebeyah Camp.

The Gaia Association and UNHCR are working with Dometic AB for the production of a new one-burner stove for use in the refugee camps. A prototype of this stove should be available to the UNHCR for inspection in the coming weeks. If approved, an order for at least 500 additional stoves will be placed for 2006. This will be the next major step in the endeavor to fully supply the camp with stoves and ethanol, a goal which we believe is achievable by the end of 2007.

The next order for ethanol has already been placed with Finchaa Sugar Factory and will be collected by hired trucks in the coming days and delivered to Kebrebeyah along with the 300 CC stoves. The newly recruited staff at Kebrebeyah are ready and waiting the delivery.

When the fuel storage tanker is cleaned and ready, it will be used to store the next shipment of ethanol to the camp. The Gaia team is already working on the logistics of this and future shipments. The ultimate goal is to construct a suitable and safe fuel storage depot at Kebrebeyah which would store large quantities of ethanol, thus reducing transportation costs and guaranteeing a more consistent supply of fuel to the camp.

The Gaia Association is planning an additional trip to Kebrebeyah Camp in the next several weeks in order to increase the sample of homes for IAP monitoring. This will most likely take place to coincide with the arrival of the stoves and ethanol at the camp.

Acknowledgements

The Gaia Association wishes to acknowledge the assistance provided by the UNHCR field office in Jijiga and the ARRA office in Kebrebeyah. This trip could not have taken place without their support. The technical support provided by the Rural Energy Development and Promotion Centre was central to the success of the trip and the Gaia Association expresses its thanks for their involvement.