

THE GIZ DADAAB HOUSEHOLD ENERGY PROJECT

A PRESENTATION BY:

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**DURING AN IMPROVED COOKSTOVE COLLOQUIUM HELD AT NAIROBI
SAROVA PANAFRIC ON 7TH JUNE, 2011**

ABOUT DADAAB REFUGEE CAMPS

The United Nations High Commissioner for Refugees (UNHCR) Program in Dadaab, administratively located in both Dadaab and Fafi Districts of Garissa County of the North Eastern Province of Kenya, some 500 km from Nairobi and 80 km from the Kenya/Somali border is in its 19th year of existence. Unfortunately, the situation inside Somalia continues to deteriorate. The volatile security situation that characterizes the Somali capital Mogadishu paints a bleak picture in terms of prospects for repatriation of the Somali caseload. Indeed, in spite of sustained border closure by the Kenya Government this year, more asylum seekers continue streaming into Kenya further swelling the refugee population in Dadaab. The new arrivals are also expected to continue within the near future putting pressure on the scarce resources and environment.

The Dadaab refugee camp complex comprises three discrete sites namely Ifo, Dagahaley and Hagadera and Ifo 2 which is currently under establishment and Ifo 3 and Alinjugur which is expected to be established in 2011, all within 23 km radius of Dadaab trading centre and covering a total area of 50 square kilometers. The camps are located in an environmentally fragile semi-arid area where local and refugee communities struggle to share the scarce natural resources. Due to the climatic challenges, tense relations with the host population and Government restrictions, refugees are unable to cultivate or keep livestock to sustain themselves or even engage in a meaningful employment outside the camps. In addition, the viability of the limited commercial and productive activities possible in the camps is severely curtailed by the encampment policy, which prevents them from travelling outside the camps to procure materials and merchandise, or sell their products. The refugees in the camps are therefore completely dependent on subsistence assistance from UN agencies and NGOs. Since 1991, UNHCR has been providing care and maintenance assistance to these refugees this is expected to go on for now and in the near future

The population served in the three camps continue to increase on monthly basis, and currently it stands at 347,972 (25th May 2011).

To the extent possible, the project aims to address priority areas as management of the environment in a holistic manner through afforestation, environmental education, household energy management, support to natural resource management structures and firewood provision.

Majority of the refugees (97.5%) are from Somalia. The rest are from other countries such as Ethiopia, Sudan, Eritrea and the Great Lakes region. An extra camp is also expected to be opened within the year in Alinjugur, about 12km from Hagadera Refugee Camp to decongest the already congested camps and improve protection and service delivery.

Environment Project

The *overall* objective of the UNHCR Environment Project being implemented by GIZ is to improve the living conditions of refugees and host community and promote collaboration between the two in conservation and rehabilitation of the environment in refugee hosting areas. GIZ is the lead Energy and Environment Implementing Partner of UNHCR in Dadaab.

Environmental Degradation due to Energy Needs

The main need for energy at the refugee camps is for cooking. Firewood is the principal source of cooking fuel. At the start of the refugee camps, firewood was harvested between 5 and 10 km from the camps mainly by women and children. In the 1990s when the camps started banditry was a major problem in North Eastern Kenya and Dadaab area in particular. Women fetching firewood were often raped by the bandits thus making it difficult for them to go out to fetch firewood to cook the food provided by WFP. As a mitigation measure, UNHCR introduced a Firewood project for refugees with the objective of:

- Reducing sexual based and gender violence (SBGV) on women and children
- Providing the firewood as humanitarian assistance to help cook the food given
- Sustainably managing the firewood harvesting to minimize adverse environmental impacts through a programme of managed harvesting zones, monitoring quality of the wood harvested.

Firewood is a renewable energy resource. The distance from which the firewood is gathered has increased over the 20 years from 5-10 km to 70 km at present.

The rate of resource depletion is directly proportional to the radial distance from the camps. The environmental impacts of firewood in Dadaab refugee camps are:

- Firewood supports biodiversity – hence depletion deprives the soil of nutrients necessary for plant growth and resident organisms. This will deprive the life cycle of the resource jeopardizing its renewable.
- Increasing firewood harvesting distances raises the price. This increases the number of poor refugees who cannot afford to buy the firewood. There is also the risk of increasing sexual based and gender violence. Protecting refugee women from SBGV is a protection issue for UNHCR.
- More donkeys carts will be required to deliver the FW to the market causing more environmental degradation

Production and Distribution of Energy Saving Stoves

The Project was started in 1993 by then GTZ (now GIZ) and UNHCR as part of the Renewable Energy Supply Conservation Utilization and Education (RESCUE) Project. The main objectives were to:

- Provide humanitarian aid to refugees by reducing the money, time and effort they would have used to access firewood for their household energy needs.
- Reduce exposure to SBGV by limiting the frequency refugee women would go out to fetch firewood
- Increase environmental conservation through reduction of collection of dead wood

Firewood Consumption

The average daily firewood consumption per person for several Kenyan districts was averaged at 1.4kg/person/day for three 3 stones fire place and 1.0 Kg /person/day for Maendeleo stove according to surveys conducted by different consultants. Use of Maendeleo stove had considerable reduction on amount of firewood used averaging 0.97. This is nearly 40 % energy saved.

This data compares favorably with data obtained in the refugee camps where Family size 6-8 typically report using 6-7 kg per day when using Maendeleo stoves and 10-12 kg person/day with three 3 stones fire.

Improved Cook stoves in Dadaab Refugee Camps

For many years, UNHCR and BMZ have been supporting the implementation of fuel efficient stoves (FES) and firewood distribution programs. GIZ has distributed firewood and promoted a number of stoves designed to reduce fuel consumption compared to the traditional open fire stoves. This has been with various motivations including reducing the gender-based violence and insecurity associated with fuel gathering; improving health of the users through reduction of smoke and excess heat from the kitchen, freeing up fuel gathering/cooking time, improving food security; and reducing environmental degradation mainly deforestation.

Main Fuel Efficient Stoves in use

For many years the fuel efficient stove of choice by refugees has been the Maendeleo Portable Stove due to its many advantages over the others tried or being tried in Dadaab Refugee Camps.

Maendeleo Portable Stoves

The Maendeleo Portable Stove was designed in late 1980s by Kenyan and German experts with financial support from GIZ Special Energy Project. The stove was subjected to rigorous laboratory and field testing by the experts before mass production by individuals and groups. It is also being produced by GIZ in Dadaab and Kakuma Refugee Camps. The field tests were carried out in the 8 Provinces of Kenya while the laboratory tests were done at Kenyatta University's Appropriate Technology Centre. The Maendeleo Portable Stove is now widely used in Kenya by both rural and poor urban people because of its many advantages. It is one of the most ideal stoves for both Emergency and Care and Maintenance Refugee situations. Production of the stove was also introduced in Goma, Zaire (now Democratic Republic of Congo) by GIZ for the Rwandese Refugees.

Production

The Maendeleo Portable Stove is made of a metal cladding and a fired ceramic liner. The two components are assembled together using vermiculite (insulation) or any other bad conductor of heat materials and ordinary cement. A reasonable Stoves Production Unit is capable of producing about 2,000 complete Maendeleo Portable Stoves per month. The tools needed for stoves production are simple, relatively cheap and readily available in most hardware shops.

Metal Claddings

These are made out of used tar drum sheets, tar drum bottoms or any other soft gauge metal sheet.



Tar drum sheets



Tar drum bottoms

Ceramic Liners

These are made of pottery clay and sand. It is a delicate process that requires care at all levels. It is done by skilled potters or artisans. The moulded ceramic liners are allowed to dry for a period of time before they are fired in kilns using firewood. The drying period depends on weather and clay type. The production process is as shown below.



Red soil



Riverine clay soil

Stoves Distribution Strategies

Since it is not possible to issue stoves to every refugee, beneficiaries are jointly identified by their leaders and GIZ Field staff depending on need and vulnerability.

(a) Criteria used when selecting the beneficiaries

- New arrivals/influxes.
- Settled refugees without energy saving stoves or with unusable old stoves.
- Those moved to Safe Havens for special protection if they do not have a stove.
- Bigger family sizes are given priority.

(b) Distribution of stoves to beneficiaries

- Stoves are delivered at GIZ Firewood Distribution Centres or Central Tree Nurseries from where they are distributed.
- GIZ Field Officers contacts Section and Block leaders who mobilize beneficiaries and inform them of the distribution days and time.
- In case number of stoves available is not enough for all beneficiaries in a Block, first priority is given to new refugee arrivals, elderly people, physically disabled, those living or helping terminally sick persons or orphans.
- Distribution is witnessed by UNHCR Field Officers or any other interested party for transparency and accountability.

(c) Ideal Situation

- UNHCR standard family size is of 4 to 5 people.
- Families with more than 4 people should get two or more Maendeleo Portable Stoves.
- Priority is given to new refugee arrivals, elderly people, physically disabled, those living or helping terminally sick persons or orphans. However, in Dadaab Camps all refugees are “vulnerable” and require equal treatment.



Distributing Maendeleo Portable Stoves to Refugees in Dadaab

Using the Maendeleo Portable Stove

The Maendeleo Portable Stove can use any type of dry biomass material as cooking fuel.



Refugee women using Maendeleo Portable Stove in Dadaab Refugee Camps

Advantages

- Fuel efficiency of 45% - 50% over the open fire place.
- Can use all forms of dry biomass materials: firewood, animal dung, maize cobs, maize stalks, cotton stalks, grass, wood shavings etc.
- Safety – can be handled with bare hand after long hours of cooking.
- Aesthetically appealing and user friendly
- Has a life span of over 4 years if properly handled.
- Cooks faster than 3 stone fire-places.
- Emits less smoke if properly used
- Portability – can be moved from place to place.
- Do not require special or spacious cooking place
- Can accommodate different cooking pots for different family sizes
- Requires minimal maintenance.

Maendeleo Fixed Stove

- Is made of a fired ceramic liner which is fixed onto the ground using gravel and soil mortar. It is smeared with cow dung and ash.
- Is one of the most ideal fixed stoves for emergency refugee situations.
- Is not popular among the refugees and nomadic communities.
- Can use most of dry biomass materials: firewood, animal dung, maize cobs, maize stalks, cotton stalks etc.
- Fuel saving of 45% over the open fire place.
- Has a life span of over 4 years if properly handled.
- Is safer than 3 stone open fire-places.

- Cooks faster than 3 stone open fire-places.
- Emits less smoke if properly used.
- Do not require special or spacious cooking place.
- Requires constant maintenance.



Fired Maendeleo Liner

GIZ Rocket Stoves



GIZ Rocket Stoves in a Refugee Camp

Mud stoves



Mud stove

New cookstoves on trial

Last year, three new types of cookstoves were introduced by the United Nations World Food Programme (UNWFP) and the United Nations High Commissioner for Refugees (UNHCR) for joint pilot testing with GIZ in one of the Refugee Camps (Hagadera) in Dadaab. These stoves are Envirofit, Save80 Stove and its Wonderbox.

Save80 Stove

- Was designed in Germany and is made of stainless steel to ensure a life-span of many years, high efficiency and burning at high temperatures for complete combustion with low smoke emissions.
- The Save80 is a whole metal stove.
- The name “Save80” means it can save 80% of the firewood consumption over a traditional open fireplace or 3 stone-fire places.
- Uses small pieces of wood, which are not traditionally collected and burned.
- Is suited for cooking, heating and sterilizing water, frying and deep frying.
- Do not require special or spacious cooking place.
- Requires constant maintenance.



Lighting Save 80 stove



Save 80 stoves and pots without lids

Wonder Box

- Was designed in Germany and is made of materials specially designed for the heat retaining of food and water up to the boiling point. After 12 hours, the temperature of 6 litres of water remains above 65 degrees Celsius.
- Last long
- Cooking by Wonderbox is very simple and needs no surveillance.
- Is suitable for most of the foodstuff cooked by the refugees.
- Do not require special or spacious cooking place.
- Requires constant maintenance.



Operating Wonder Box Cookers

Envirofit

The Envirofit is manufactured on a large-scale basis at a centralized facility in India and commercialized throughout the world. According to the manufacturer, it reduces biomass fuel use by up to 60 percent, and cooking time by up to 50 percent.



The photo above shows the Envirofit stove model currently being promoted in Kenya, the G-3300. The ongoing pilot testing of a small number of this stove in Hagadera camp reveals that:

- It can only be suitable for a family size of 3 or fewer, as it does not allow for larger size pots.
- It requires constant loading of small pieces of firewood, which means the cook, must constantly tend to the fire, requiring additional time.
- Because its combustion chamber heats up very quickly, the Envirofit stove cannot be used to cook *injera*, a staple food for Ethiopians and Somalis which requires more even heat over a large surface.

Training and Extension

GIZ have teams of experienced extension workers in each refugee camp who visit and train refugees on how to use the fuel efficient stoves before and after they receive the stoves. These teams are recruited from the respective refugee communities or where applicable the host community.

Comparing different cookstoves during a cooking demonstration



Cooking with Maendeleo Portable, Wonder Box and Rocket stoves



Maendeleo Portable Stove



Traditional 3-stone open fire stove



GIZ Rocket Stove



Mud stove



Cooking with Save80 stoves



Operating Wonder Box Cookers

type



Women serving cooked food after a training session

Challenges

The main challenges are:

Inadequate funds

Production of improved stoves in Dadaab is donor funded through UNHCR and number to be produced and distributed depends on funds provided. GIZ as the Implementing Partner (IP) of UNHCR has the capacity to produce and distribute as many Maendeleo Portable Stoves as 2,000 per month. Though the capacity can always change as per need

High population

Both refugee and host community population has been on sharp increase for the past 4 years due to the civil war in Somalia and the droughts in North Eastern Kenya. Four years ago, the refugee population was less than 120,000. Today the population is 347,972 persons and 108,292 households. As for the host communities, many families have been forced to move into the refugee camps or shopping centres near the camps. All these have increased serious demand on services being offered by the Kenya Government, UNHCR and its Implementing Partners.

Current levels of production from GIZ Stoves Production Unit (SPU) in Dadaab and outsourced stoves totaling approximately 22000 per year are just adequate to cover annual new influx of refugees and host community demand. The rate of coverage will continue to decline since there is a cumulative loss due to depreciation of the stoves. The Maendeleo Portable Stoves last between 3 and 4 years. Based on a life span of 4 years, it is estimated that 25,000 stoves require replacement annually.

Bad Roads

Majority of roads in North Eastern Kenya are impossible when it rains, which makes it very difficult to transport raw material, especially clay soil.

Successes

Despite the above challenges, GIZ has been able to produce and distribute enough Maendeleo Portable Stoves to cover an average of 68% of the 108,292 refugee households. This means that about 73,639 Maendeleo Portable Stoves are in use in the 3 refugee camps according a survey carried out by GIZ Dadaab early this year.

Based on the current refugee population of 348,000, the annual consumption of firewood using the traditional 3 stones fire pace (1.4 kg/day/person) is 177,828 metric tons. But using the documented savings of at least 40% (0.9 kg/day/person) the annual consumption of firewood for the same population would be 114,318 metric tons. 63,510 metric tons of firewood would be saved.

The benefits of the energy saving stoves in general are huge and clearly appreciated by the beneficiaries. The reduction of firewood collected from the environment has huge impact on conservation of flora and fauna. There is however no sufficient data to estimate this benefits quantitatively. The intervention is relatively inexpensive but one that has huge cumulative impact on household incomes and protection of the environment.

Way Forward

The stoves last between 3 and 4 years. Based on the life-span of 4 years, it is estimated that 25000 stoves will require replacement annually. In order to meet the growing demand, at least 30,000 stoves need to be outsourced this year. Annual production at GIZ Stoves Production Unit (SPU) in Dadaab should be increased to at least 15,000 stoves.