ESDS · ENERGY SOLUTIONS FOR DISPLACEMENT SETTINGS

ETHIOPIA

PROMOTING ADOPTION OF IMPROVED COOKSTOVES IN REFUGEE AREAS: USER-CENTRED DESIGN (UCD) APPROACH

PROJECT

Energy Solutions for Displacement Settings (SUN-ESDS) is a component of the Global Programme Support to UNHCR in facilitating the operationalisation of the Global Compact on Refugees in the Humanitarian-Development-Peace Nexus (SUN), which is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). (Period: 11/2019 – 12/2024)

Technology	User-Centered Design (UCD) cookstove
Area	Gambela
Partners	Refugee & Returnee Service (RRS), Ministry of Water and Energy (MoWE), United Nations High Commissioner for Refugees (UNHCR)

CONTEXT AND OBJECTIVE

Food is vital for human survival. In humanitarian or displacement settings around the world, refugees receive core relief items and food. As of February 2024, Ethiopia is home to a total of 972,835 refugees and asylum seekers. Among them, 386,123 reside in camps located in Gambela. Increment in the number of displaced people in the region is increasing the requirement of resources for energy access and food. The heavy reliance on biomass resources from local flora and the adverse indoor air pollution implications of traditional energy usage (firewood) is degrading to human health as well as the environment. One way to reduce it is through household-level energy efficiency enhancements and a proactive approach to widespread adoption of improved fuel-saving stoves.

Sometimes stoves are being provided to refugees, but the problem arises when these stoves provided often go unused and may even end up being thrown away, often because the challenges of fuel access and successful adoption by users in humanitarian settings are not sufficiently taken into consideration.

SUN-ESDS Ethiopia is actively engaged in providing training, technical know-how, and material support to local cookstove producers. The aim is to develop UCD cookstoves that reduce emissions, environmental impact (including deforestation), and health hazards like indoor air pollution, especially among women and children in displacement settings and host communities in the Gambela region. Local producers are collaborating with retailers in refugee camps to distribute these improved cookstoves, with an aim for achieving higher adoption and satisfaction rates from consumers as well as better income generation for the producers.

Majority of refugees from South Sudan

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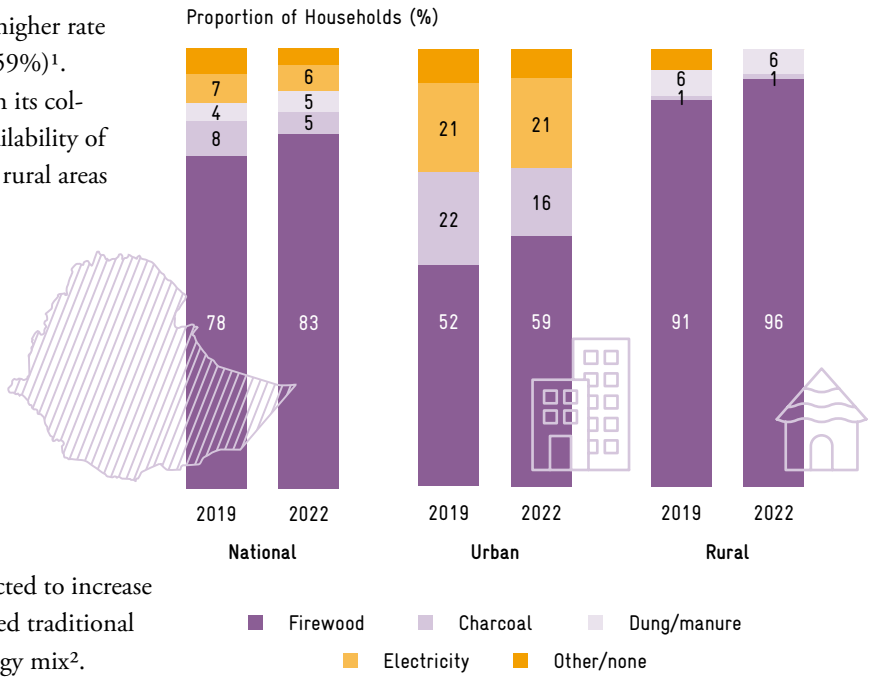
CHALLENGE: THE BURDEN ON BIOMASS RESOURCES FOR COOKING

Firewood is the primary source of energy for cooking. At the national level, 83% of households, in 2022, depended on firewood for cooking, up from 78% in 2019. Households in rural areas used firewood at a much higher rate than households in urban areas (96% versus 59%)[1]. Women and girls especially are burdened with its collection. Limited electricity access and free availability of firewood has kept the rate of deforestation in rural areas higher in recent years.

Ethiopia fuels and technologies used for cooking by scenario, 2018 – 2030

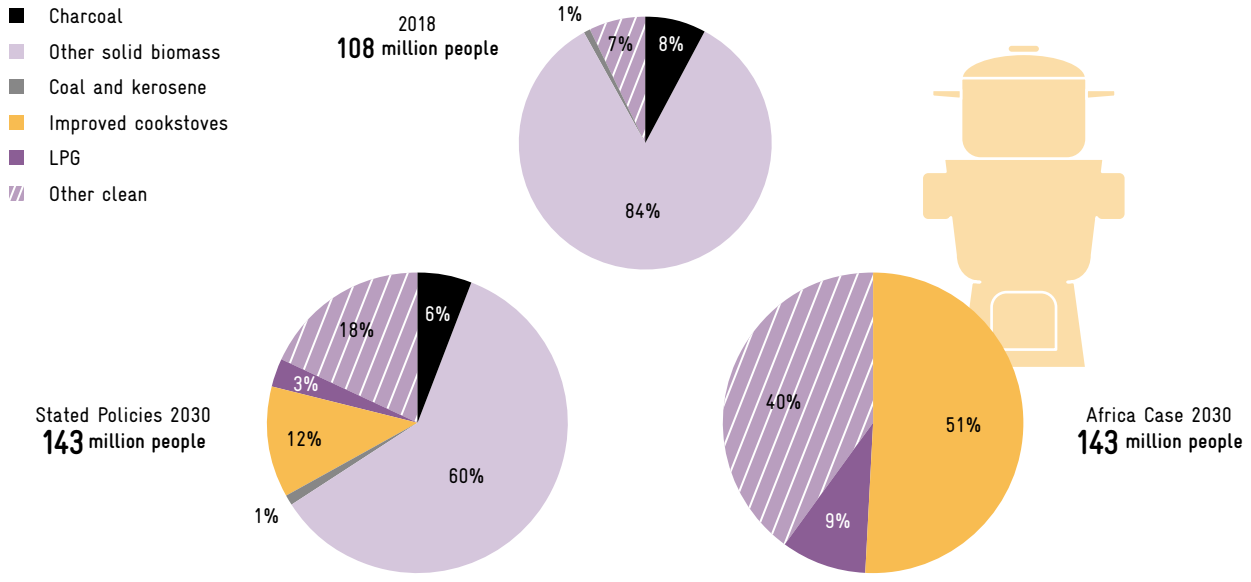


Source: https://www.statsethiopia.gov.et/wp-content/uploads/2024/01/2021-22-Survey-Report.pdf

CHALLENGE: ACCESS TO CLEAN COOKING AND THE USER ASPECT

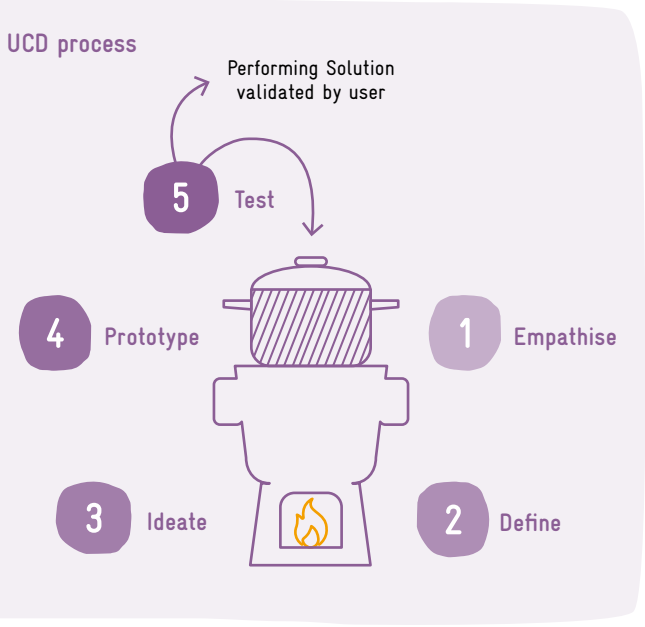
Access to improved cooking solutions is expected to increase in the coming years but biomass resource based traditional cooking is still expected to dominate the energy mix[2]. Transitioning to improved and cleaner forms of cooking will require not only increased availability, and affordability of solutions, it requires as well meeting the needs of the end consumers.

Ethiopia fuels and technologies used for cooking by scenario, 2018 – 2030



Source: https://www.iea.org/data-and-statistics/charts/ethiopia-fuels-and-technologies-used-for-cooking-by-scenario-2018-2030

1 Ethiopia Central Statistical Agency, 2022: https://www.statsethiopia.gov.et/wp-content/uploads/2024/01/2021-22-Survey-Report.pdf
2 Ethiopia Energy Outlook: https://www.iea.org/articles/ethiopia-energy-outlook



Source: User-Centred Design to create sustainable cooking energy systems

APPROACH: DEVELOPING SUSTAINABLE MARKETS

SUN-ESDS Ethiopia focuses on market development and capacity building of local and public stakeholders via the following mechanisms:

- Training for producers to improve their technical, business, and marketing skills.
- Technology development by improving stove designs that meet the requirements of the end users. Integrating consumers in the technology development process (UCD).
- Promotion of the private sector to facilitate local production of UCD-based stoves.
- Awareness generation through public demonstrations.
- Cost reduction within supply chains and creation of access for clean and efficient cooking stove alternatives.
- Conducting efficiency assessments of stoves to ensure high-quality products.

PILOTING THE UCD APPROACH

The most common approach in cooking energy solutions is to produce or procure stoves with the highest fuel-saving values without consulting the users. If the selected stove model does not cater to the users' cooking needs, the stoves are unlikely to be utilized. However, the UCD approach prioritizes the cooking habits and needs of the users alongside efficiency and emission reduction. This guideline facilitates meeting the anticipated paradigm shift.

ADVANTAGES OF THE TECHNOLOGY

By extracting user demands and initiating designs based on their input, the UCD approach ensures that the final product will be better accepted by users. Switching from the traditional three-stone open fire to UCD stoves decreases firewood consumption by promoting efficient combustion, thereby lowering harmful emissions such as carbon monoxide and particulate matter. Additionally, UCD stoves come in two variants tailored to different fuel types: one for charcoal and another for wood. These stoves are manufactured using locally available materials to ensure sustainability in their production and procurement.

Efficiency

An efficiency assessment was carried out on the stoves in May 2024. The test was conducted in accordance with Ethiopian Standard (ES) ISO 19867-1:2018 for thermal energy performance and safety.
The multifuel and fuelwood UCD stoves demonstrated thermal efficiencies of 21.5% and 22.2%, respectively, resulting in tier 2 values. In the case of thermal efficiency with charcoal, the values were measured at 24.3% and 25.3%. Regarding safety ratings, they scored 70 and 69, respectively.

WAY FORWARD ON THE UCD APPROACH

Before a cooking energy system is used it needs to reach the users. Shorter value chains with production closer to the users can react better to changing user needs and increase adoption through a refined product that people want to use. Shorter value chains can be scaled easily on a sustained basis with less resources compared to lengthy procurement processes for costly imported products. Involving skilled UCD experts in all steps along the value chain can minimise involvement of humanitarian or development agencies in future operations. The chances that value chains can be sustained over time normally increase if more steps from production, distribution and operation of the outlets can be operated through private and local businesses. The aim is that the value chain can eventually function on a sustainable market-based approach.
A detailed list of recommendations and risks involved can be referred to in the study here.

Completion of the Pilot Phase

25 representatives, of which 21 adult women (5 from the host community and 16 from the camp) as well as 4 men from the camp, were engaged in stove design development process. Inputs were taken on their usage, cooking behaviours, and fuel availability.

Cookstove prototypes created for different fuel requirements which were tested and validated for real life usage.

300 people (180 female and 120 male) from refugee and host communities took part in awareness and marketing training on UCD-based improved cookstoves.

A total of **862 UCD based stoves were manufactured** and disseminated at the household level. 23 schools in seven refugee camps of Gambela use three stone stoves. ESDS piloted an IRS (Institutional rocket stoves) in three camps to introduce efficient and less emission stoves in social institutions.

A **producer cooperative of 15 members** is organised.

A **shed for production and storage is constructed** for UCD cookstove producers.

Published by:
Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
GIZ Ethiopia:
Energy Solutions for Displacement Setting (ESDS) Ethiopia
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Metro Hospitality Building-MHB (8th floor)
P.O. Box 34, Addis Ababa, Ethiopia
I: www.giz.de/Ethiopia

Bonn:
Friedrich-Ebert-Allee 32 + 36, 53113 Bonn
E info@giz.de
I www.giz.de/en

Addis Abeba / Bonn 2024

Author/Responsible/Editor, etc.:
Meron Alemu & Nishchay Mehrotra
Christa Roth & Natalie Rzehak

Design/layout
DITHO Design GmbH

Photo credits/sources:
GIZ/ESDS Ethiopia