



MAKING MUD STOVES IN SUDAN

Mud stoves have been used in Darfur with internally displaced people (IDP). This Technical Brief looks at some of the issues related to this type of stove and how they should be used. The mud stove is a low-tech and low-cost wood burning do-it-yourself solution.

In certain situations it can be better to start with a low or no-cost stove that women can build and maintain themselves, that does not create fire hazards by falling over, that keeps any money exchanged revolving within the community, that does not radiate heat just where they are sitting, that does not have a limited life, and does not have an intrinsic value and can therefore be stolen.

Beyond this level of stove then there are a great many options that can be considered.

A metal stove (Tara) was also introduced into the refugee camps which was manufactured centrally and distributed to households. There is a cheap mud rocket stove that has been introduced elsewhere in Darfur. Rocket stoves are a more recent development of stove and are more sophisticated in their construction. They have an improved combustion chamber and use insulated walls to improve the stove efficiency.

The mud stoves need to have a particular approach to their introduction to ensure that they work properly.

- The mud stove is designed to fit the pot it is built for. Each cook user must be trained to build a number of stoves to fit the different pots she uses in cooking.
- Each trained woman must be given a manual prepared for use in training (a pictorial manual designed to help women even if they are illiterate)
- The women need to be trained as trainers so that they can pass on their skills to others.

If the approach changes then the resulting stoves do not perform with any great efficiency. For example: pre made stoves made to uniform dimensions will not match with the cooking pots and this results in a drop in efficiency.

Although the mud stoves have their limitations they are suitable to certain circumstances in which mud is readily available when other materials such as metal are not. This means that the un-insulated mud stove can be better than an open three stone fire but are never going to have very high efficiencies. It is therefore important to choose the best option for the particular circumstance and to have awareness of the technical issues.



Figure 1: Training in self-build stoves. Photo: Practical Action, Sudan.

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The stove needs to match the cooking practices of the people who are going to use them.

The main benefit of this stove is that the women can make the stoves for themselves so that when IDP return to their homes they take with them the knowledge of how to manufacture and maintain the stoves without any external inputs.

Building the stove

Using the approach in which each family makes their own stove to suit their particular pots after they have received training on the making stoves and on how to train others so that the quality of the stoves remains high. The concept of the design passing from person to person introduce the possibility that the design will deteriorate if training is not good enough.

The stoves are made from locally available materials which comprise of bricks, water, mud and donkey dung. The mud used should be a heavy clay mud which in some cases is taken from river beds.



Figure 2: Mixing the materials. Photo: Practical Action, Sudan.

Ensure that the materials needed to make the stove are actually locally available; if they need to be brought in to the area from a distance then this will negate the benefits of using local materials.

The mud is mixed with the animal dung.

The bricks or parts of bricks are used as the three internal stands for the pot. These are then placed on the base and the mud walls are built up around them.

Once the basic shape has been created then then the hole for feeding the fuel can be cut out before the mud has become hard.

The stove needs to be left to dry before it can be used.

The difference between a high performing and an ineffective stove can be a matter of a slight change in a critical dimension. A wrongly matched pot and stove will result in poor combustion and increased smoke.



Figure 3: Cutting the hole for fuel access. This needs to be large enough for wood and ventilation. Photo: Practical Action, Sudan.

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The stove design is not suitable for rapid distribution of stoves but is more suited to a gradual dissemination through training and exchange of skills.

Improvements on the basic design

These can be incorporated into the stove and allows the stove to be more adaptable.

If ventilation is poor holes can be made to the base of the stove and a metal grate can be fitted. The stove would need to be lifted off the ground for air to flow into the hole at the base. Vertical channels down the inside walls of the stove can be added to allow better ventilation. By comparison the Anagi stove has additional holes added to the side wall to improve air flow.

To allow a flat plate to be used for cooking on the top of the stove, which is common in Sudan, three knobs approximately 40 mm can be added to the top edge of the stove. This allows ventilation when the plate is used which would otherwise block off any air flow.

Project background

The stove design originates from work of FAO and Practical Action (then ITDG) and was promoted in Darfur by CHF with support from Practical Action (then ITDG) in refugee camps for internally displaced people in Darfur, Sudan.

Further information

www.chfinternational.org

<http://cookstoves.lbl.gov/>

<http://cookstoves.lbl.gov/darfur-archives/pdf/dsp2005.pdf>

Aprovecho report about FES in Darfur

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