Rocket stoves for Sub-Saharan Africa

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Background

Since Aug 2003, my partner, Jayme Vineyard, and myself have been working with GTZ ProBEC (Program for Biomass Energy Conservation), EAP (Energy Advisory Project), World Food Program and several small businesses to introduce the Rocket Stove principle to a number of countries in Sub-Saharan Africa (Uganda, Lesotho, Mozambique, Malawi, and Zambia). Most of our work has focused on building institutional stoves (stoves for boarding schools, tea estates, prisons etc. . . .) but we have also built bread ovens, household stoves and kilns.

In March, one of our project partners in Malawi (Eastern Produce Tea Estates) asked us to help them design a new stove that would be more fuel-efficient then their existing open fire. The estate cooks for 40 000 people per day so their choice of stove has far reaching impacts on the health of the workers and the forests. The tea estate's open fires use 170 kg of wood to cook Nsima (corn porridge) for 55 people. Using Rocket stove principles; we built a new 100 litre cook stove that uses only **13 kg of wood** to cook the same amount of food.

We also built them a 200-litre stove that uses 9.5 kg–13 kg of wood to cook enough *Nsima* for 220 people; this is approximately 160 kg less wood to cook twice as much food. Yes, it does seem counterintuitive that the larger stove uses less wood. Write me if you would like more info on how this works.

Less fuel *and* less smoke

These two stoves have cut the estate's fuel consumption by more than 90% as compared to the open fire. The stoves produce almost no visible smoke, and yet they have no chimney – a fact that amazes people each day, all around the world (Figure 1). Devoted readers of *Boiling Point* know that Dr Larry Winiarski and Aprovecho Research Center developed the Rocket Stove – a unique system for cleanly burning biomass (see *Boiling Point* 47 page 36) in the early 1980s – but it wasn't until the last few years that the Rocket Stove has gained widespread recognition and acceptance.

One of the keys to producing a smokeless Rocket stove is to find inexpensive, local, and durable materials for the combustion chamber. In Malawi, we have been blessed to work with Dedza Pottery. They have helped us produce an insulative refractory brick that is light (0.67 g/cc) and durable (Figure 4). In other countries we have also used pumice blocks, vermiculite and non-insulative ceramic surrounded with insulation.

If you would like more info about any of these stoves, please contact me at apropeter@hotmail.com or http://solstice.crest.org/discussiongroups/resources/stoves/Scott/subsahara.htm

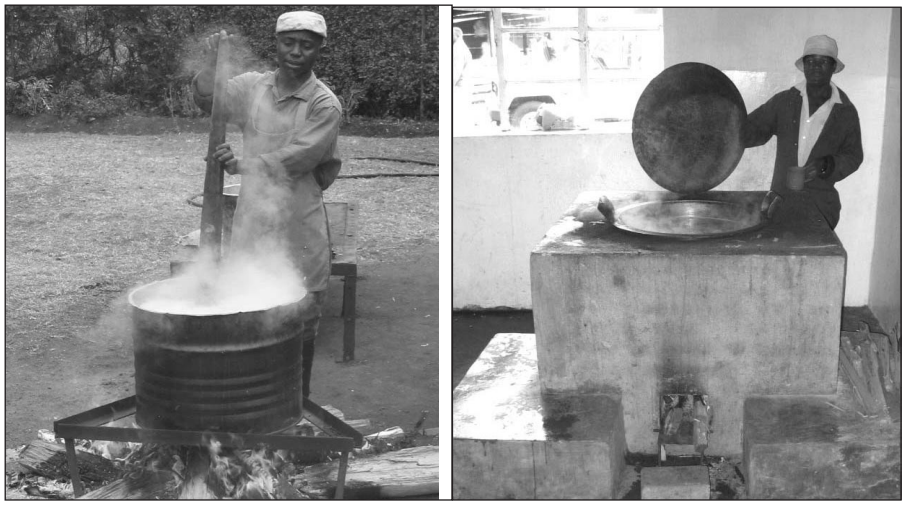

Figure 1 Open fire using 170 kg and rocket stove using 13 kg of wood to cook equal quantities of food – note the absence of visible smoke with the rocket stove. (*photos: Peter Scott*)

Figure 2 Quantities of fuel used by open fire and rocket stove to cook equal quantities of food (*photo: Peter Scott*)

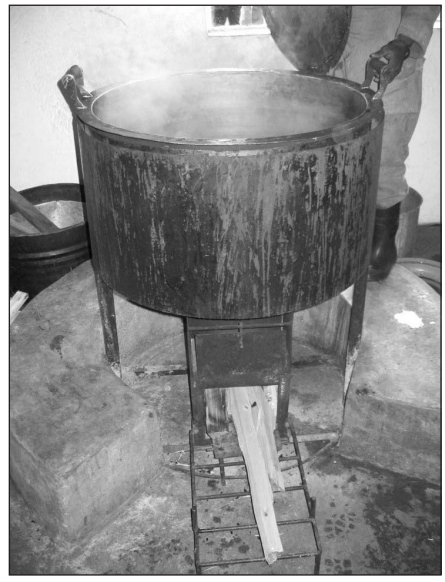

Figure 3 200 litre stove for cooking *Nsima* (*photo: Peter Scott*)

Figure 4 Combustion chamber in rocket stove being made (*photo: Peter Scott*)