

Clean cooking

Progress report November 7, 2014

The September trip through Malawi was very successful in many aspects. Firstly the distribution of the household stoves has been reorganized and will be finalized soon. This opens the possibilities for the next container in spring 2015. The Institutional Stoves were found to be positively received although some minor adjustment was needed. And it turned out to be clear now: in urban regions there is an absolute need for high efficient charcoal stoves. There is only a limited market for wood stoves in the towns. Finally, although I had to skip the planned trips to Rwanda and Nairobi, the modern communication tools enabled me to gather a lot of useful information. Next spring I will create a second choice.

1. Institutional Stoves

The last couple of months 12 institutional stoves (100 l cooking vessel) have been brought into the country. Three stoves have been donated: two schools received each one stove and one stove has been installed in a prison. These ultra-high efficient stoves are meant to replace masonry stoves, open fires and electrical cooking vessels. The presently used wood stoves use a tremendous amount of firewood while the masonry stoves regularly require expensive maintenance. The electrical cooking vessels are difficult to repair and power failures are frequently occurring during cooking time.

Already after a couple of weeks in operation the users reported a decrease in the firewood of 75 % and a shortening of the cooking time by clearly more than a factor of 2. The smokeless environment is very much appreciated. However, some cooks preferred a larger pot (200 – 300 l) or an additional 100 l stove.

An additional 9 stoves are meanwhile in stock in Likuni. These have been offered to the interested parties for 850 USD. A retailer in Blantyre has already contacted us, while the Ministry of Education (school feeding program) has shown a lot of interest but they have still a problem of finding interested donors.



I had arranged a meeting with Kennedy Nkhoma, Chief Commissioner of Prisons. This meeting really looked like a two-traps rocket. First with his entire staff to a wrong prison where the whole uniformed group started to stare at me because I was cheating them: no new stove had been installed in this prison. I really was not aware about the fact that this particular town (Zomba) had more prisons. We made a restart and went again with 4 cars to the right prison. They really were amazed about the performance of this cooking device.

The stove installed in the St. Anna school in Mchinji was a tremendous success! They made a



nice fitting hole in the roof for the chimney. An example for others and indeed 6 schools have already been visiting them. They are using the stove for 3 meals a day and also for making tea. Although they had only 200 students, they could easily use a bigger pot. Amazing was the extremely low amount of heat radiation compared to their standard metal pots. The heat goes where it has to go viz. to the pot for cooking the meal. Several years ago an monstrous masonry

stove equipped with three cooking locations was constructed. Because the enormous amount of wood usage and expensive maintenance, which was required every semester this cooking device has put out of order already a while ago.

2. Dissemination of woodstoves

Due to problems at the border the container arrived at its final destination early March this year, which was about 3 months after the scheduled delivery time. Consequently, the start of the distribution was at a wrong time. In this time of the year the women could not afford the small financial contribution. The yield of the previous harvest was spent, while the revenue of new harvest was not yet available. Later in the year Cadecom Lilongwe encountered a severe lack of manpower due to organizational problems and pregnancy.



Meanwhile both problems have been solved* and we agreed that all stoves and accessories will be distributed before year-end. To reach this goal other dioceses will be actively involved. Especially in Dedza diocese was a great success: the stoves are being sold as “hot cakes”.

* I could admire my youngest grandson and noticed only minor or no resemblance at all.

We have noticed that in many health centres there is a need for heating devices for their autoclaves (sterilization of med. equipment). Paraffin burners: expensive and supply problems. Electrical autoclaves: either the available power (ESCOM) is too low (it takes hours) or they don't function at all. The health secretaries of both Lilongwe diocese and Dedza diocese will investigate the need in the health centres in their catchment area.



3. Charcoal Stoves

Although from environmental point of view it is better to burn wood directly using high efficient wood stoves the use of charcoal is traditionally and socially determined. People will not change their habit and thus early next year we will start to distribute the most efficient charcoal cookstove in the urban regions. It has been shown by an in-depth study (2007) that the charcoal business is one of the largest in Malawi. In that particular year the usage of charcoal in the 4 major urban regions was 230,000 metric ton annually (15,000 ha woodland). In view of the population growth these figures will have been increased by about 30-40 %. As

we want to establish which charcoal stove has the preference of the woman and what price are they able/willing to pay early next year we plan to start a pilot both in Blantyre and in Lilongwe. A more efficient, environmentally friendly production method which uses only half of the wood compared to the traditionally earth kilns should be applied parallel to the introduction of high efficient cooking stoves. Combining both technologies we will save 75 % of the wood reserves!

4. New stoves for an affordable price

In Tanzania a dealer sells 1000 woodstoves and 4000 charcoal stoves on a monthly basis. Dealer price 24 USD for M-5000 woodstove and 28 USD for the large charcoal stove (CH-5200). These relatively low prices can only be reached with carbon credit or others supporting funds. The future of the carbon market is uncertain and donor money will never be sufficient to support larger groups of users. Thus there will be a demand for cheaper and simpler efficient stoves. Envirofit has recently launched the Econofire and the Econochar (both suited for variable potsizes onto 13 l).

The Econofire woodstove has been tested in Malawi by Willem, Annie and in the communities. Very positive feedback with respect to wood usage and speed. The amount of smoke seemed to be slightly higher than observed with the M-5000.



Laboratory tests of the Econofire show an extremely low emission of CO accompanied by a reduction of PM by only 47 % which is in line by subjective observations of “some smoke”. The reported 31 % thermal efficiency is super! The brand-new cheap alternative for the charcoal

stove (Econochar) has not yet been field tested by us. Laboratory data show that with respect to fuel use this charcoal stove is identical to the CH-5200. The improvement in CO reduction is even better than observed for the other 2 more expensive charcoal stoves.

5. Overview of the available stoves

	USD	MKW*	Wood/Charcoal % reduction	CO % reduction	PM % reduction
CH-2200 charcoal	44	20,000	65 %	58 %	NA
CH 5200 charcoal	56	25,000	58 %	49 %	NA
Econochar charcoal	31	14,000	57 %	62 %	NA
M-5000* wood	56	25,000	74 %	79 %	70 %
Econofire wood	31	14,000	68 %	77 %	47 %

Performance improvement versus 3-stones (wood stoves) or traditionally Jiko stove (charcoal)

*Consumer prices 2014

*M-5000 including potskirt for a better performance

Reduction in cooking time of the Econochar versus the CH-2200 is about 25 %.

Cooking on the Econofire is reported to be 30 % longer than cooking on the M-5000. Seems to be in contradiction with subjective observations during recent field tests in Malawi.

PM emission during charcoal burning is negligible and thus not reported.

6. Various

After a lot of miscommunication the Institutional Stove was arrived in the Health Centre in Kigali (Rwanda). The stove has been installed meanwhile: they utilized the chimney completely by making a perfectly fitting hole in the roof. We agreed to receive a bimonthly report. Some huge programs with respect to 200 – 300 l pots are announced by the government. It will be interesting gain insight into the performance of their design compared with the Envirofit Stove.

The meeting with Yamungo Botha (Concern International) was very constructive. apart from the Chitetezo Mbaula (clay stove) his organisation is becoming more and more interested in high-end technology like the Envirofit products. His mother is using an Envirofit M-5000 and is super enthusiastic about the performance. His experiences with the forced draft Philips cookstove are somewhat disappointing with respect to price, the use of kindling (tiny pieces of wood) and the fact that in 10 % of the cases the battery is not functioning anymore (storage time too long because of a low throughput).

Tax exemption and carbon assets have their permanent attention.

The request of Concern International is to pay more attention to charcoal in the urban regions.

Giel de Pooter