In search of advise on concrete stove building in developing countries.

First of all please note that my English is far from perfect and if clumsy it's because I'm trying to explain what I find difficult even in my own language, so bear with me.

I'll try to tell you about and show you the stoves made by a small NGO in Singida, Tanzania, called Shina Group in corporation with a few people from the Danish NGO called Danish Tanzanian Friendship Association (DanTan).

I really don't know much about stoves and even less about concrete stoves. I was invited to visit Singida and participate for two weeks in stove building and talks about introducing the stoves to people in Singida and villages around Singida because of my knowledge of Swahili, my craftsman skills (I'm a boatbuilder) and the experience I've gained of Tanzanian culture during a 6 years stay back in the seventies and then because a member of the Danish project group could not go.

The problem with the concrete stoves that met me and my Danish companion was not very pleasant and very hard to solve with our knowledge of concrete. Cracks in most stoves after using the stove for a short period, cracks eventually leading the stove to fall apart if the stove had not been surrounded with a brick and mortar kind of wall that would hold the stove together even if it cracked. When the idea of making concrete stoves was first hatched the expectation was that not too heavy and cheap stoves with an outlet for a chimney could be sold in Singida town and the villages around Singida (I think the chimney hole was one of the reasons for making the stove in concrete, another that concrete is a cheap and easy to handle material).

The project has received money from a Danish government fund to help the local NGO in marketing the stoves but marketing was not possible because we did not have a concrete stove that worked. Our answer to that problem has been to put the marketing project on hold for 5 months. The first 3 months (that is untill the end of june) Shina Group will be testing ideas and looking for better stove models and after (hopefully) having found some really good ones they will spend 2 more months making and selling a small series of stoves to be tested by customers in their kitchens. After that Shina Group will start introducing the new models to people in and around Singida.

	Picture 1 shows some of the stoves being used for cooking a meal. You can see the burnt bricks (bottom/right) that are pounded into small pieces and used as part of the concrete mixture.

Picture 2 shows the three concrete stoves before being lit.

The stove to the right is an old concrete stove for burning sawdust and shavings. This kind of stove is used in about 10 kitchens but almost all are built into a big lump of clay and bricks, something like the last picture shown here, in that way keeping the concrete block together even if it cracks. The people using this stove like it a lot because a big bag of sawdust and shavings can last a week and it is easy to get hold of free sawdust in Singida. The kitchen is also equipped with a three stone fireplace as well and smoke from that fireplace will fill the kitchen. One problem with this concrete stove is that it's heavy and not easy to transport. Another is that once installed it's very hard to move.

The stove in the middle is an experimental model for burning firewood. Trying to avoid cracks by making the stove from 5 individual pieces. Didn't last very long before the topplate cracked at the red lines though.

The stove to the left is a new sawdust burning model made from 4 separate pieces held together with wire and then filled in the middle with concrete round a big plastic pipe which is removed after the concrete has cured a little.

	Picture 3 shows the sawdust stove made from four pieces. It's been lit. Before being lit it's been filled with sawdust compressed round a center pole from the bottom to the chimney hole, then the centerpole is removed and the stove is lit at the bottom with a bit of kerosene and a match. It then burns slowly from the bottom to the top and is almost impossible to put out. We don't know yet if this stove is going to survive for long.

	Picture 4 shows an old concrete stove made in one piece and with a big opening in the front so that it can be used for firewood. Again we don't know if this stove will last very long. Probably not considering that the same model used with sawdust usually cracks after some time.

	Picture 5 shows a stove made of clay burned in a kiln. It's from before the concrete stove building began. As far as I know it worked okay for a period of time and is easy to transport. It doesn't have the chimney though and smoke will fill the kitchen and hurt your eyes, nose and throat
	Picture 6 shows a stove for firewood built from clay bricks and clay. It is being used every now and again. It's a huge thing to have in a kitchen and not very mobile. Price is probably not low either.

The concrete mixture most trusted consists of:

12 liters of crushed bricks*, 3 liters of ordinary cement and 4 liters of water.

* the ones seen in the first picture bottom right .Broken building bricks left after burning bricks for a house and free to take.

One last thing, I've been wondering about, is how long the concrete stove has to be left for curing. It's apparently about 2 weeks in Singida but as far as I can read from the various papers on concrete the curing lasts more than 2 weeks and if the stove is used too soon after being made, water will disappear from the concrete, I think. But having no concrete knowledge I'll have to ask peoble who know. Hereby done I hope.

Hope this will be enough to give you some idea of our project and problems and hopefully make you interested in sending us useful advise.

Sincerely Klavs Heeboell klavsheeboell@hotmail.com