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Solar Clutch

Here is brief report of our recent efforts in Mauritania to adapt solar cooker technology to the local community. This was our second trip in collaboration between Solar Clutch and Lutheran World Federation.

It is well known that the social uptake by the local people is the most difficult part. The local foods must be cooked in a way acceptable to the people as well as the technology must become indigenous for it to become self-sustaining. In Mauritania we were blessed with some local women who were very innovative to try new techniques of cooking. One of the main staples of the local people is the local couscous, powdered with the dried fruit "flour" of the baobab tree. It must be steamed rather than boiled in water to the place where it will soften and cook. To accomplish this was quite a feat of cooking as the one lady showed us in a home video on her cell phone. The second main staple is fish and rice boiled in a lot of oil, not something a solar cooker does well. Again the same woman was able to do this in a two-step process to obtain the desired outcome in flavor and consistency. Obviously only a local woman can adequately succeed to cook to the standards of the local people! We applaud the cook!

The other issue of making the solar oven more indigenous was what we focused our attention upon this trip.

1. We copied the Cookit pattern using special cardboard box material manufactured in Nouakchott for holding fresh fish from the ocean. It is more durable than regular cardboard since the glue to make it is resistive to moisture. The cookers were narrower than a regular Cookit because of the standard size of the box material. However, they worked very well and cost $2.50
2. We brought along a Haines Cooker donated by Roger Haines to see if we could use it as a pattern for local sheet metal. We went to the local newspaper printing company and purchased two sheets of the largest aluminum printing sheets they had available. This was after they had been used to print and were to be recycled into aluminum cooking pots. The aluminum was not anodized nor was it a shiny mirror finish but it was reflective enough to use as a solar oven. We screwed two of the sheets together and made a jumbo Haines cooker, probably 1/3 larger than the original one we brought. It tested well and will be a good option for the local people to cook with one pot. Cost was $4.00

3. The third option was to utilize the shiny zinc/tin roofing material that is available throughout the country and elsewhere in Africa. The reason being, the aluminum and the cardboard for the first two models both have a bottleneck on the source. It will not be acceptable for everyone to just walk into the printing

company or box factory and buy one sheet of material. Eventually the source will limit who can purchase and then only in large amounts. The zinc pan however can be purchased anywhere by anyone for $4.00 a sheet plus some sheet metal screws. In Mauritania the zinc pan is imported and only available with rolled ridges. Some countries import it in flat stock shipped in large rolls and form it in the country. Because it was only available with preformed ridges we could not utilize the Haines design as the material would not cooperate. So we designed two totally new designs, each one utilized one full sheet of the zinc pan. Both cooked well when tested. The rounded model holds two pots easily and has good intense focus on the central area. The rectangle model is not so intense in focus but will hold three pots easily. On a clear sunny day both worked very well. Cost $4.50 (None of the three sheet metal models can be folded up but must be left open and stored that way in the court yard or outside storage room.)

4. The problem with using cooking bags is magnified here in Mauritania because there is now a prohibition on producing local plastic bags. This is because of the huge issue of trash waste the bags cause. Other "bag" options needed to be explored. We brought along our clear Sterilite brand storage boxes and cooked in them using the local pots with great success. There was no problem at all with heat retention or off gassing. The box material is clear polypropylene, food grade and is the same material as the autoclave bag material. Upon searching the local market we found clear 15 liter water buckets with lids made out of the same food grade polypropylene. To cook in the bucket was easy. The clear bucket was inverted on its opening with the pot set on the bucket cover/lid. A sheet of aluminum foil was placed under the pot between the pot and the bucket lid. The bucket seal was great and the cake cooked perfectly. When a local pot was used you could see the water boiling off the top of the pot inside the bucket. The women were so pleased with the alternative options since not only the bucket but rectangle clear boxes are also available in the local market. Cost for the boxes and buckets is an issue that need to be address by working directly with manufacturing companies to bring the price down and avoid the middleman markup.

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