

## **San Diego Coastal Rotary Club District Grant: Request for Matching Funds**

This project will provide a Durable Solar Cooker, "DSC", to 343\* recipient families living in refugee camps in East Africa. The project is Sustainable, Measurable, and Community driven, and is aligned with all areas of focus as described by Rotary International. The project will be completed this Rotary Year 2012-2013. The project was presented to our Board by a fellow Rotarian, Roger Haines of San Diego Club #33. Roger has greatly improved the design of solar cookers currently provided in African Refugee Camps.

### **About the design:**

It is well-recognized that the cardboard solar cooker currently distributed in refugee camps, while well-designed, is not durable, and requires the use of awkward plastic cooking bags. Roger's new design overcomes both problems.

#### *Attic insulation replaces cardboard*

Roger has replaced the cardboard with 4' x 3' attic insulation made in the USA. It consists of a tough double-bubble wrap with an outside layer (on both sides) of reflective Mylar. The two-sided reflective material enables the design to be "flipped" in case of damage or obstruction to one side. The bubbles are almost impossible to break, it is impervious to boiling water, and the Mylar does not tear. Side-by-side testing against the cardboard cooker shows that it heats up just as fast, and it maintains the same cooking temperatures.

#### *Polycarbonate cylinder replaces turkey bag*

Besides cardboard, the most unpleasant part of solar cooking has been the need to enclose the cooking pot inside some kind of "greenhouse", typically an oven-proof cooking bag. The bags are expensive, and they collect condensation from the cooking process. Within a few days, they become grungy and smelly, and then they break. The bags also make it difficult to monitor the cooking process. Experimentation has shown that it is not necessary to completely enclose the cooking pot. If the bottom and sides are insulated, the pot stays just as hot as when the entire pot is enclosed in a turkey cooking bag. To insulate the bottom and sides, Roger uses a 6" x 30" rectangle of 0.020" polycarbonate film rolled into a cylinder and secured with paper clips so that it is exactly the size necessary to fit under the outer rim of the cooking pot. It also supports the pot, and elevates it 2" off the surface of the cooker, thus allowing the bounced rays of the sun to heat the bottom of the cooking pot. The polycarbonate cylinder looks very elegant, and when the cooker is rolled up and put away, the polycarbonate cylinder can be wound tighter and used to hold the rolled-up cooker.

### **Community Assessment:**

Solar Cookers International posted an online report from a Nairobi-based Center for Independent Research regarding solar cookers in East African Refugee Camps, particularly the Kakuma Camp. The report states that fuel gathering is forbidden outside the camp with only 1/3 of firewood demand provided. Solar cookers make sense in this area due to the sunny, remote, arid climate. "Often the only 'money' refugees had was a portion of their sparse food rations to barter for essential fuel to cook the rest."

#### *Peace and Conflict Prevention/Resolution*

Due to stereotypes, men were seldom found cooking for families. The report showed that solar cooking generally was not regarded in the same manner as fire-based cooking devices. The effect on a male contribution to the household has eased some gender tensions. The increased economic performance provides for less crime (theft) and less tension amongst neighbors. The environmental impact of the cookers, due to less smoke, is inevitable as well.

#### *Disease Prevention and Treatment/Water and Sanitation*

In the study above, "Refugees also praised solar water pasteurization. [The solar cooking devices] contributed to the reduction of the incidences of waterborne diseases. Other noted benefits included increased safety for children (as opposed to dangerous cooking fires) and the ability to let food cook for

extended periods of time, while other activities are carried out, without the risk of food burning.” The smoke from indoor cooking lead to increased health problem in women and children as well.

#### *Maternal and Child Health/Basic Education and Literacy*

Families who use Solar Cookers experience a dramatic change in lifestyle. Vegetables are cooked in solar cookers without water, so they retain more of their nutrients. Where in the past women/children would spend time collecting firewood for fuel, they are now provided more opportunity in childcare and potentially seeking primary education. The extra income provided by green energy and economic surplus (microfinance) sustain future growth for generations.

#### *Economic and Community Development*

“Saving money was a primary benefit. Families that solar cook whenever possible could save up to 510 Kenyan shillings (nearly \$7) per month, or over 50% of their monthly fuel expenditure. In addition, families that barter food for fuel could save over 20 kilograms of grains monthly.” In addition to fuel savings, the Cookers transitioned to a sales-based program in the camp. With the use of Microfinance, Entrepreneurs could buy solar cookers at wholesale and sell them at retail. Cake is considered a luxury food and is one of many products that can be produced for sale and profit. Our District is currently working through Mobilizing Rotary through Microfinance in these areas. “Disabled and vulnerable individuals appreciated the cost savings and reduced physical burdens associated with solar cooking.” Whereas most dishes require constant stirring and attention on a fire-burning stove, solar cooking does not require such actions since the bottom of the pot will never burn.

#### **Partnerships:**

We are intentionally seeking a partner through Rotary (D9200) even though this is not a requirement for a District Grant. D9200 seems like a perfect candidate due to our District relationship and the response rate in past grant applications. We are seeking a Rotarian partner in Kenya who is familiar with customs and refugee camp relations. We chose East Africa due to the target population and accessibility of shipping arrangements (Kenya). We want to ensure we have strong supervision and feedback for the project.

Our main goal is to attract attention for other NGOs such as USAID by initiating this “pilot” project in a refugee camp. In less than 48 hours, we had inquiries from 16 clubs throughout the world expressing interest in conducting a similar grant utilizing this design. We think this new design is revolutionary and will be widely adopted. If so, it will lead to greater acceptance and ultimate commercial success for solar cooking. A Rotarian in District 9200 will provide to us photographs and a written description of the distribution of the solar cookers and the training provided to the refugee women. A Rotarian in District 9200 will return to the refugee camp approximately 30-90 days after the solar cookers are delivered and will provide us with a written report on problems that may have been encountered, and what percentage of cookers are still being used. We will use that feedback to determine possible changes to the design.

Roger, in partnership with his San Diego Club #33, helped raise the funds for this venture. The funds will be allocated based on the budget provided under the “Financing” tab. An itemized budget is provided under “Documents”. The “Photos” tab portrays each individual line item, in addition to conceptualize the final product. Our vendors are chosen solely based on price. Though we currently have received quotes for items in the US and China, we are attempting to lower per unit cost each day and hoping to retain partnership for all items here in the States (price permitting). Our club members will participate in cutting the reflective material to design specifications and packaging for shipment. Shipping is based on an estimated value, but will be finalized when we have a specific location. The manuals will provide step-by-step instructions (w/pictures) regarding assembly and storage. The manual will be uploaded to the “Documents” tab, in addition to project updates and feedback over time.

**Bottom line:**

We have been in contact with many Rotarians from East Asia to West Africa, Europe, South America, and North America (including RI) who have stressed interest in this project and wish to replicate it. We passionately believe Roger will change the world with this innovative approach to solar cooking; it will produce hundreds-of-thousands of opportunities for people all over the world. We anticipate this project will be considered for a Global Grant through multiple districts in which I will anxiously and willingly support any requests for participation.

*\*In the event that prices are lower, we will put the savings into more cookers.*