

SIMPLEST SOLAR COOKERS AND WOMEN'S MICRO-ENTERPRISE

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ABSTRACT

Solar cooking promotes self-sufficiency through income generation and/or fuelwood savings for families. Households that cook with the sun report that the money they save is used to for many other purposes, such as extra food, school supplies, medications, and cooking fuel for times when the sun is not shining. Several local women will benefit doubly from time for additional income generation in addition to fuelwood savings at home. For those who choose to sell solar cookers, this activity can be done flexibly, within women's many other tasks, on a scale that suits the interest of the businessperson. Other business opportunities include making, distributing, retailing and maintaining solar cookers, training others, providing after sales services, and selling solar cooked foods. All these are possible only because of the CooKit, the world's simplest most affordable solar cooker.

1. INTRODUCTION

Solar cookers and solar cooking are still viewed by many as mere novelties, despite the serious cooking fuels shortages experienced by over 2.5 billion people in the world. Surprisingly, most of these people live in sun rich regions of the world. To date, dissemination of solar cooking in many parts of the world, has been small and scattered through humanitarian organizations that have distributed cookers free or on heavily subsidized – strategies with limited potential for being self-sustainable and self-spreading. In an attempt to break from this cycle, SCI is developing a process to make a truly affordable solar cooker accessible in a sustainable manner. First was the invention of the CooKit, the world's least expensive and least complicated family-size solar cooker,

followed by the successful local manufacture of the CooKit in the country of need. Meanwhile, SCI developed information and educational materials that were field tested in SCI's own projects in refugee camps in Kenya and Ethiopia.

Finally, SCI is currently putting in place a market oriented dissemination in their projects in Kenya. Besides the benefits of the cooker itself, the strategy aims at promoting self-sufficiency through income generation and fuelwood savings for families. It also affords the women gainful engagement, rather than being left to frustrations and despondency. Already women entrepreneurs are beginning to emerge in Nyakach, first as a deliberate effort by SCI and also on seeing the success of the SCOREPs, other women are beginning to sell solar cookers on their own. This process has great potential for replication in many sunny, fuel-scarce countries.

2. TECHNOLOGY DESCRIPTION

Panel solar cookers are the first solar cookers that are truly affordable to the world's neediest. In 1994, a volunteer group of engineers and solar cooks associated with Solar Cookers International developed and produced the first "panel" cooker, the CooKit. Elegant and deceptively simple looking, it is an affordable, effective and convenient solar cooker. It requires a dark, covered pot and one plastic bag per day or one high-temperature plastic bag per month. With a few hours of sunshine, the CooKit cooks tasty meals for 5-6 people at gentle temperatures, cooking food and preserving nutrients without burning or drying out. Larger families use two or more cookers. The CooKit weighs half a kilogram, folds to the size of a big book for easy transport. CooKits are

now produced independently in 25 countries from a wide variety of materials at a cost of \$3-5 US. In the case of Kenya and Sunny Solutions in particular, women hand make the CooKits dubbed the OYWA CooKit. We expect that the new hand-assembled CooKits will outlast the manufactured CooKits which last for two years.

OYWA CooKit is a unique modification of the factory made CooKit, it is branded with SCI's LOGO, has instructions on it on how to set it, it is waxed on the back to enhance its durability, and has firm coloured binding on the edge to hold the cardboard together and to enhance its beauty. Further to this, it is made on site by women and youths who earn extra income from this activity. The best part of this whole set up is that it lowers the cost hence increasing accessibility to almost all economic cadres of the community. In addition, the community is proud as it is a home – grown product. Mr. Nyango'r , an elder in NYACODA. says, "We are not just beneficiaries, we are manufacturers!"

CooKits complement other cooking methods needed at night and on cloudy days. Coming about twenty years after the first efforts to replace open fires with improved cooking stoves, the CooKit uses no fuel at all. The CooKit is both user-friendly and environmentally friendly. The Cookit can save two tons of wood over its two-year average life, reducing a family's fuel needs by one-third to one-half, without the pollution from smoky fires. Cookits can pay for themselves within two or three months as a result of savings on fuelwood.



Fig. 1 Faustine Odaba with OYWA CooKit

On 9th September 2005, the OYWA Cookit won the prestigious PAWII Award (Pan African Women Invent and Innovate Award) organized by International Finance Corporation in collaboration with GWINN.



Fig. 2 Dinah Chienjo with the award.

3. WOMEN'S ENTERPRISES.

With the realization that unless the solar cookers enter the commercial market, its widespread use hence impact would also be limited, In 2003, SCI begun introducing and creating a market for solar cookers in four of the fourteen administrative areas of Nyakach, a community of 113,000. This was after the introductory phase in which SCI staff; 1) carried out solar cooking demonstrations in public places and at community events, 2) aired radio spots in local languages, 3) distributed 150 cookers with instruction to pilot families, 3) and provided additional training of trainers (TOT) to fifteen of the most enthusiastic new solar cooks from the pilot families. These women now lead local promotion by selling cookers and providing instruction. These women are referred to as Solar Cooker Representatives – SCOREPS.

4. SCALING UP

The success noted with the first 15 women working in 4 of the 14 locations led to the scaling up, increasing the number from 15 to 24 to cover all locations and in some areas sub – locations of Nyakach. While most Nyakach businesses are operated by men, SCI's enterprise development targets and encourages women, as the primary cooks and best spokespersons for kitchen devices. Women who already sell other cooking supplies and household products were identified and encouraged to sell cookers as well. Already two Nyakach women who operate small restaurants and food kiosks have found solar cookers to be convenient and economical. Other experienced solar cooks earn income for demonstrations and providing instruction on cooker use.

To further make solar cookers accessible SCI (EA), with the assistance of the SCOREPS, identified 4 shops

strategically located to serve their needs in and near their areas of operation. Each shop is managed by a committee of SCOREPs and is run on a daily basis by one of them. These shops named: COOKERS' SHOPS stock:

- Plastic bags
- Solar CookKits
- Black painted pots and lids
- Black painted kettles (To encourage solar water pasteurization)
- WAPIs
- Energy saving wood stoves
- Match boxes
- Water treatment products e.g. chlorine
- Cookit making materials.
- Instruction booklets
- Other fast moving products to help sustain the shops.

The shops are branded as permanent advertisements and reminders on the benefits of solar cooking. At the shops, services offered include; cooking demonstrations, pot painting, CooKit repairs (a minimal fee is charged) and trouble shooting. Through the shops public education continues, by distributing flyers, calendars and other informative publications like the SuNews and Solar Cooker Reviews.



Fig. 3 The shops

In addition to sales made at the shop counters, the SCOREPs are sales agents, accessing the materials from the shops, they reach out to customer at home, in school and in any public forum within the location. Women need not walk to the shop, they can get replacement plastic bags from a SCOREP nearby or get their problem solved. These hard working women have managed to sell 1,500 CooKits at market price. The SCOREPs advertise, meet client needs, provide after sales service and repairs, and adapt products and services to local conditions. Some have begun to grow their business by going into nearby areas. SCI nurtures solar cooker enterprises by linking them to training, supplies, and microfinance organizations as needed e.g. Women's Economic Development C? Organizatin (WEDO).

5. RESULTS

Our pilot project in Upper and Lower Nyakach Divisions, in Nyanza Province has confirmed that public awareness coupled with local access can translate into strong demand for solar cookers. Local women sold over 1,500 low-cost cookers, with uptake by over 5% of the population in two years. Their clients report monthly savings of US \$2.60-8.00.

Boiling water requires expensive fuel. A recent survey on water treatment practices in Nyakach found that households that boiled some times and solar water pasteurized the remainder of the time reported half the overall incidence of diarrhea for children under age five compared to households that only boiled. We anticipate self-sustaining local access to solar cookers in Nyakach by 2008.

Other benefits of solar cooking adoption is outlined in the following manner:

a. Addressing Fuelwood Scarcities:

- Solar cooking one meal a day, three times a week has been proven to reduce fuelwood consumption and related smoke by one third.
- The CooKit saves more than four times its value in fuelwood each year. With careful use and storage, a CooKit can be used for two years, reducing fuelwood consumption by two tonnes.

b. Improving Health

- The CooKit can pasteurize household drinking water, making it safe to drink.
- The solar cooking process is smokeless, reducing respiratory diseases and eye irritation
- Solar cooked foods retain vitamins, nutrients and their natural flavors; there is no smoky taste; the foods cook slowly in their own juices. Nutritious, slow-cooking traditional foods (beans, root crops, and some grains) are restored to the family diet Clean up is easy as the food never burns or sticks to the cooking pot.
- Solar cooks frequently report that the money they save on cooking fuel purchases is used to for many essentials, such as extra food, school supplies, and medical care.
- Without having to gather wood or dung, breathe smoke, and tend a fire – all associated with traditional cooking – solar cooking is easy and safe for people with AIDS and other illnesses, the elderly, disabled and young orphans.

c. Enhancing Household and Women's Economic Status

- The CookKit represents a new opportunity for women to capitalize on an underserved market and better meet their own cooking energy needs
- Solar cooking saves time as there is less need to tend a fire or collect firewood. A person can cook while at work, at the market, or tending crops. Young girls can attend school instead of searching for fuelwood.
- Solar energy is free and abundant in many areas of Kenya, providing a safe, clean, healthy supplement to traditional fuels.

d. Environmental Benefits

- One CookKit saves 2 tonnes of wood in a year, Imagine 150,000 solar cookers and many more.
- Cleaner air from less smoke emitted to the atmosphere
- Reduced rate of global warming
- More trees surviving to maturity hence more rain, better agricultural production less famine.
- Checking on the advancement of the deserts.

6. CASE STUDY OF ONE SCOREP, SELINE OSIAN

Seline wakes up early at 6 a.m. and does household chores up to 8 a.m. Then she goes out for solar cooking activities until 5 p.m. Her average income from such activities is about Kshs.2,500 per month. Through this income she can now afford to budget for her family. Her lifestyle has greatly changed. She now feeds her children well. Clothing and feeding her family is no longer a headache that it used to be.

Seline Osian started solar cooking at the beginning of the project in March 2003. She was one of the beneficiaries of the initial trial cookits and she was one of the most active cooks from Mbogo Women's Group, a quality which made her be chosen as a trainer. Before then, she engaged in petty trade, which earned her very little income. Her monthly incomes ranged from Kshs.750 to Kshs.1000 per month. With four children then, she found it very difficult to make ends meet.

As a result, her family fed on ugali and vegetables except on few occasions when they could afford fish. Malnutrition was rampant among her children, her third born child called 'Ras' was nicknamed a quarter (oloriyo). Her husband says one could carry the child in one palm and not feel any weight. It is a miracle that the boy is alive today, says Seline. She attributes this to the coming of the Sunny Solutions project in Nyakach. To her this was a blessing from God. Since March 2003 life has changed for Seline and her family. She was recruited as a trainer and now a SCOREP (Solar Cooker

Representative) in the SCI's Sunny Solutions Project in Nyakach.

She has undergone several capacity building trainings both within and outside Nyakach and also attended an International Conference by Solar Cookers International in Nairobi in February 2005. Her skills in cooking have been enhanced. 'I now eat delicious meals', says the husband. 'Am now healthier than I used to be, look at Ras; the boy who was so thin that you could carry on one hand'.

Seline can now plan her time well. Fetching firewood, which previously was done on daily basis, is now done once every three days. She used to take about 2 hours fetching firewood. Now she saves a lot on firewood consumption and time.

Solar cooking has become part of her life. She solar cooks on most sunny days and pasteurizes her drinking water. Firewood is therefore only used at night and on cloudy days when there is no sunshine. She saves Kshs.450 per month. After saving for sometime she bought a goat at Kshs.750 in early 2004. That goat has given birth to four kids.

Throughout 2005, she paid fees for her 2 children in nursery school amounting to Kshs.5,500. The two children are now in class 1.

Her husband is very proud of her and takes part in looking for customers and carrying out demonstrations. He has gained skills and can use the cookit to train other people especially when Seline is not around and customers come to ask about how cookit works. He has personally created awareness to about 150 people and facilitated the sale of 20 cookits. Life is made easier for him by the income that Seline brings home. It has brought relief to the family. Whenever he goes out he does not worry a lot about what the family will eat. He is sure to find food on the table even when he is broke.

He is also happy when Seline is called to various functions either to solar cook or to bake cakes. Villagers regard Seline highly, due to her cooking and training skills. Young mothers like Seline who initially shunned solar cooking and thought she was only wasting time from her family now are buying solar cookers, and compared to the previous days they are feeding their families better and their clothing is better.

Seline herself now has dresses costing Kshs.900 apiece', a neighbour commented. Due to the exposure Seline now has a lot of confidence when training crowds of people on solar cooking or giving school talks in secondary schools and elders meetings (barazas). Seline, the shy housewife, is now an outgoing and courageous trainer on solar cooking. She has gained a lot of respect and fame

in the village. People read her stories in the SUNEWS and see her photographs on calendars. They call her 'Mama Solar'.

7. CHALLENGES

1. Reaching the critical mass in a poverty stricken rural community.
2. Attitude and behavioral change take much longer than anticipated.
3. Prolonged training and exposure may lower profits in the long run
4. Competition from seasonal availability of affordable alternative fuels.
5. Prolonged capacity building for some of the women who maybe good solar cooks and maybe also very enthusiastic but have no business acumen.
6. The durability of the product as compared to other stoves.
7. Breaking from the NGO – handout syndrome.
8. Support from other stakeholders, e.g. government, the private sector and other NGOs.

8. CONCLUSION

Besides continuing to advocate for and to promote solar cooking through its field tested dissemination strategies, SCI believes that small enterprises run by experienced solar cooks are an important way to spread solar cooking. Low-tech, affordable solar cookers involve modest start-up costs and limited overheads.