

SOLAR COOKER DISSEMINATION: LESSONS LEARNT

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ABSTRACT

Technology dissemination has always had its challenges depending on the need for it, accessibility, practicability and affordability. Currently in Kenya, the mobile phone technology has taken everyone by storm. This can be easily explained by many factors including fixed lines that do not always work and exorbitant charges. Yet the mobile phone is not cheap, as a family of six may be using a total of 12,000/= shillings per month.

In the same manner, solar cooker dissemination has its challenges and its strengths. Experiences with disseminating solar cookers to a settled rural community in western Kenya has given rise to many lessons which will be highlighted in this paper. It is not always true that real need will automatically lead to technology adoption. Neither is it true that accessibility, practicability and affordability will lead to quick, long lasting adaptation and adoption.

What is near to the truth is that there is need for constant awareness creation across all genders and ages of the community. There is also the need to use all kinds of media that may be available and can be accessed by the beneficiary community. Another lesson learnt is that approaching the beneficiaries as groups works better, as there is peer pressure and there is more assurance in numbers than working with individuals. Further, there is need for a long term support for the first adopters in these introductory activities by any organization wishing to disseminate solar cooking technology. Beyond awareness and skills training, there is need for continuous education either by way of flyers, talks, radio spots or billboards to the community, with the message that solar cookers complement other cooking technologies and the advantage inherent within them is that the sun is free of any charges, the sun is available at the point of need and can be accessed by all who live in sun rich regions of the world.

1. INTRODUCTION

Solar Cookers International (SCI) is a nonprofit organization whose mission is to assist communities to use the power of the sun to cook food and pasteurize water for the benefit of people and environments. Seventeen educators and engineers with the vision of enabling people to cook with the sun started SCI in 1987. It has two offices, one in the USA and the other in Nairobi, Kenya, East Africa.

SCI (EA) is a charitable organization that oversees field projects, spreads awareness of solar cooking and coordinates information exchange with environmental, education, agricultural and domestic energy groups. SCI (EA) also provides: 1) Technical and other support to other organizations wanting to introduce solar cooking, helping to create on-going access through sustainable businesses. Most recently, SCI (EA) has assisted solar cooker promoters in Kenya, Uganda, Rwanda, Somaliland, and Tanzania. 2) Educational materials including an eastern Africa regional newsletter informs 2,000 people at the local, national, and regional levels about solar cooking workshops, the activities of various solar cooker promoters, and information on various solar cooker designs and instruction booklets for making and using solar cookers in English and local languages.

With help from its many volunteers, Solar Cookers International (SCI) developed the CookKit and the WAPI, two accessible solutions for communities dealing with cooking fuel shortages and unsafe water. Solar cookers such as the CookKit can cook food using only solar energy. The Water Pasteurization Indicator (WAPI) can be used with the CookKit, to indicate when heated water has reached the temperature where it is free of harmful pathogens. These low-cost tools are simple and effective, and have tremendous potential for sun-rich, fuel-scarce areas. The development of the CookKit made production of thousands of solar cookers feasible and enabled SCI to start demonstration projects at refugee camps in Kenya and Ethiopia in the mid-1990s.

2. SIGNIFICANT RESULTS AND DESCRIPTION OF STRATEGIES

Since its inception, SCI has trained more than 25,000 refugee families to solar cook, has educated and provided information to 4,000 individuals and organizations in developing countries, and has assisted and communicated with more than 20,000 individuals and organizations in developed countries, extending its reach to over 150 countries. SCI has co-sponsored three international conferences on solar cookers and has worked with the UNHCR and UNESCO. Currently, SCI is active in six areas: management of SCI field projects, technical assistance to other organizations and individuals, production and distribution of educational materials, networking and information exchange, research, and advocacy and outreach. Financial support for carrying out its mission comes from its 2,300 members, from sales of CookKits and educational materials, and from foundations.

In a four year project by SCI (EA) in Aisha Refugee Camp in Ethiopia, 95% of households adopted solar cookers. In a larger, culturally diverse refugee camp with high turnover of refugees, Kakuma in Kenya, 20% of households used solar cookers, double the number using fuel-efficient stoves. In SCI's, one-year-old project in Nyakach, rural western Kenya, several women have already bought livestock with money saved using less fuelwood.

Evaluation results for SCI's project Aisha refugee camp, in northeastern Ethiopia, show significant reductions in traditional energy use and that refugees saved time, money and effort when cooking with solar energy. After just four years, close to 95% of households in an isolated community in Ethiopia were using Cookkits for some of their cooking, and consumption of firewood decreased by approximately 32% compared to data from four years earlier (A. Konde, 2002). Frequent solar cooks consumed 44% less firewood and 78% less charcoal, while occasional solar cooks used 27% less firewood and 22% less charcoal. With solar cooking, refugees spent a full four to six fewer days each month gathering firewood (A. Konde, 2002).

A similar evaluation of SCI's project at Kakuma Refugee Camp was carried out in 2003. During this 8 – year project, the camp's highly diverse population grew from 25,000 to 86,000. Families with solar cookers were able to cook even when meager fuel wood rations have run out. They had less need to trade food for wood and charcoal from suppliers outside the camp, improving family nutrition.

In 2003, SCI began a ten-year effort to widely promote affordable solar cookers in eastern Africa. With a starting point in Nyakach, Kenya, SCI has been applying the global body of knowledge on solar cooker

dissemination and small enterprises to new areas to expand access to solar energy wherever other cooking energy sources are scarce. Other strategies have included: Delivery together with instruction workshops and extended follow-up of new solar cooks to ensure adaptations and maximize usefulness of solar cooking for each purchaser. First, a pilot group of women attend a daylong, hands-on workshop and get free cookers in exchange for trying local foods and giving ample feedback to trainers. After several months' time, the most enthusiastic local new solar cooks are offered new training to earn income by teaching others and distributing cookers. Other capacity building trainings followed i.e. small business management, bookkeeping, making and maintaining CookKits, pots painting and other outreach techniques. In the current project, SCI has assisted with marketing. In refugee camps in Kenya and Ethiopia, the Cookkit was distributed free, as a relief measure. In settled communities in Kenya and Zimbabwe, the Cookkit is sold at a price that covers production, transport, storage and a small profit for the solar cooker trainer/seller. SCI raises donations from members to fund start-up costs

SCI implemented what proved to be successful participatory methods for disseminating solar cookers. Seeking to broaden our efforts in a manner that would result in independent, market-based access to solar cookers, we adapted our approach to meet women's needs for energy and income generation. In a further development, the CookKit, previously factory-made in Nairobi, can now be hand-assembled, increasing the profit margin on each solar cooking kit sold and allowing decentralized production. Each solar cooking kit contains a CookKit, cooking bags, a water pasteurization indicator (WAPI), and an instruction booklet. The kit is sold for \$6 in Nyakach and returns a profit of \$1.25 to the vendor. SCI three staged implementation strategy is outlined below:

Stage 1 – Introduction.

Using the sun to cook food or pasteurize water is a concept unknown or very new to most Kenyans. With assistance from local partners, SCI facilitates the initial exposure to solar cooking in an area. Practical demonstrations coupled with information sessions targeting local opinion leaders such as chiefs and other government officers, leaders of women's groups, health professionals and representatives of development agencies. Local foods and water sources are used in the cooking and pasteurization demonstrations. The demonstrations and information continue to include women's groups, market women, teachers, and frontline health workers. Initial enthusiasm may qualify one to get a trial kit, from which they continue to practice and hone their skills. These women are visited regularly and they also hold joint meetings to discuss their successes and failures.

Stage 2 – Recruitment and Training.

In Kenya, women are the primary cooks and therefore the best spokespersons for a new cooking device such as the CooKit. Based on staff and partner observations, women who 1) use their CooKit frequently, 2) are particularly enthusiastic about solar cooking, and 3) have prior sales experience or outgoing personalities are invited to train as solar cooker representatives (SCOREPS). Training consists of a four-day intensive hands-on course followed by occasional skill building sessions on specific or advanced topics. SCI uses a participatory approach in all our projects. The solar cooker representatives will participate in pricing of the solar cooking kit, developing marketing strategies appropriate for local conditions, and sharing successful approaches with their peers.

Stage 3 – Promotion, Sales and after Sales Services.

Once trained, the SCOREPS with support from a site supervisor continue with product demonstrations and start making cash and installment sales. Some demonstrations are aimed at the general public while others target a particular group such as women's groups or teachers at a certain school. SCI provides basic marketing materials and supplies such as distinctive aprons, shirts and bags (for visibility, credibility, and 'brand association'). Direct marketing is reinforced by SCI-sponsored public service announcements on radio and special events.

The representatives earn commissions from SCI based on the number of demonstrations carried out and three follow-up visits to new solar cooks. After the profit margin given to representatives for each sale, the revenues offset the wholesale cost of additional supplies. Other after-sales services include pot and lid painting and sales of cooking bags. As the local demand for solar cookers grows, SCI gradually reduces commissions and the frequency of public demonstrations.

Documented results after capacity building include:

- ♦ Community awareness of solar cookers as a complement to traditional and improved cook stoves and as a cost-effective water treatment method.
- ♦ Women-operated local micro enterprises ranging from direct sale of solar cooking kits, sale of baked goods, and use of solar cookers in small eating places.
- ♦ Solar cooks' improved control over household resources such as cooking energy, their time, food selection, and often, the money formerly used for fuelwood purchase.

- ♦ Enhanced self-confidence of solar cooker vendors as a result of learning leadership skills, having a new source of income and public recognition of their ability to teach others.
- ♦ As skill builds in the community, women teaching their neighbors and relatives solar cooking and water pasteurization skills.
- ♦ Solar cooks in the community beginning to sell solar cookers on their own – as they see the positive changes in the SCOREPS.

Tools for Introducing Solar Cookers:

- 1) Solar cooker demonstrations including: cooking of local foods, pasteurizing water, explaining the process and answering questions while the food cooks, and distributing of food samples to participants
- 2) Local language, two-sided flyers explaining the economic and health benefits of solar cookers and how and where to buy them and information on SCI with contact location and telephone number
- 3) Radio messages, calendars (for sale), selective distribution of our regional newsletter featuring solar cooker activities in Africa, and signboards in key places, such as at markets and on the highway).

Tools for the Solar Cook:

- 1) A local language instruction booklet explaining how and when to use solar cookers, their different applications including water pasteurization, and a few recipes. This is a reference for solar cooks at project sites and a key information piece for outsiders who purchase solar cooking kits.
- 2) Upon purchase of a solar cooking kit, a new user can receive up to three follow-up visits. These home visits are an opportunity for the SCOREP to answer questions, reinforce basics such as CooKit orientation and ratio of food to water, troubleshoot and gather feedback from the cook.
- 3) Based on demand, staff share what they know about saving cooking energy or other types of solar cookers and refer requests for more information to the appropriate contacts.

Tools For Solar Cooker Vendors.

- 1) The four-day participatory instruction workshop for sale representatives covers the following topics: information on SCI and our local partner, background on the project and solar cookers, a presentation by a local microfinance group, communications and group dynamics, adult learning techniques, cooking energy conservation, how to do a solar cooking demonstration, rudimentary business concepts and practices, selling techniques, and duties of sales representatives. The trainers practice their solar cooking skills daily during the workshop.
- 2) In addition to the clothing and other supplies that increase visibility, the SCOREPs have a series of illustrations, each emphasizing key points to convey to new CooKit users such as cook when the winds are calm and cut food into small pieces.
- 3) Periodic training opportunities: water testing and solar water pasteurizing, micro enterprise operation, and marketing techniques.
- 4) “On the job coaching” during which site supervisors observe solar cooker representatives and later advise on adjustments for the next home visit or demonstration

3. LESSONS LEARNT

a. Integration of Strategies.

As detailed above, SCI has learnt that the use of a multiplicity of strategies in the citing, planning, implementation and evaluation of solar cooker dissemination projects pays off in the long run. Since solar cooking is a new technology introduced not to replace but to complement other existing cooking technologies.

b. Clear Identification of The Target Group.

The use of women who are most affected by the issue at hand was critical to successful dissemination rather than going directly to the market (dominated by men). This is because the women have adapted installment payment systems that are inclusive rather than exclusive of people with little income to dispense. In addition the right entry target in a community, the other was in the sales agents identifying the initial market for the new product and using all kinds of forums to create awareness about their product. In other words, sales agents targeted people with income such as farmers, teachers and civil servants living in the area as the first adopters.

The projects cited above have proven that solar cooking can be an important entry point in poverty alleviation through the extra income gained by the

SCOREPS, from sales of CooKits and giving other services such as demonstrations and pot / lid painting. Monies saved that would have otherwise bought firewood is used to cater for other family needs.

c. On Site Production of Solar Cookits

Where women are both consumers and producers of an energy technology, adaptation of the technology has a direct impact on women’s lives. Moving from factory to onsite production meant that now the women could earn more from every CooKit made and sold instead of the less than a dollar profit margin they got before.

Creation of an enabling environment such as local and on site manufacturing, easing access to other related products such as plastic bags and pots already painted, enhanced adoption especially to those who could buy their cookers and use them immediately while the wonder of solar cooked foods lasted in their taste buds. On the other hand local or on site manufacture through positive in job creation and pride of ownership, it does not always translate into mass adoption. It is taken for granted and people say, “We know this is a solar cooker.” Familiarity does not breed adoption en - mass despite awareness of benefits.

Further, local on site production gives rise to issues of how strategic the site is, on site assembling of materials, quality control, capacity for mass production and packaging that are all vital for successful production and marketing in the business milieu. These emerging issues need to be sufficiently addressed by SCI and other promoters.

d. Efficiency on Its Own Does Not Inspire Adoption.

Efficiency alone will not lead to acceptance and adoption, this is a lesson learnt from seeing the disuse of solar parabolic cookers that were introduced in Kakuma refugee camp after SCI phased out. GTZ, in collaboration with UNHCR, brought in highly efficient parabolic cookers, and on the assumption that refugees knew how to use solar cookers. The few businesses and families who received them soon abandoned them claiming that they required a lot of attention unlike the CooKit. In this case the speed of cooking was not the issue for the refugee, rather it was just an alternative way to cook their meals which in most cases were taken once a day in the evening.

e. Role of Partnerships / Networks

Partnerships / networks are strategies that can work well for the promotion and adoption of new technologies. However, if these are not well defined with clear roles and resources committed to the project documented, then, certain partnerships may impede rather than facilitate solar cooker dissemination. Sometimes staff turnover and program changes in a partner agency reduce or terminate its involvement. This disappoints the intended beneficiaries and wastes resources and time as well. Other lessons are:

- Reliability: The adoption of a new technology requires an appropriate framework and sufficient time. A technology such as solar cookers requires also the will of the end – users to participate in its implementation. This will must be supported with necessary knowledge and understanding of the technology in order to maintain and sustain the skills and new habits acquired.
- It is critical to integrate, synergize and synchronize the roles of all stakeholders namely, project officers, sales agents, implementing partners and the beneficiaries.
- Capacity building for key stakeholders is key to success as noted in the exposure and training provided to the local women who are SCOREPS.
- Public education and information made constantly available through the SCOREPS, has helped in maintaining support for the initiative amongst leaders and other partners thus enhancing further acceptance. Other lessons include:
 - Perseverance, as new habits take time to grow, people tend to be conservative – choosing the known even if it is costly.
 - Breaking off the NGO – handout syndrome. This phenomenon has caused a delay and at times a misunderstanding of SCI as an organization. In the refugee situation where everything was given for free, it was difficult to implement any market strategies leading to self sustaining adoption. This situation has repeated itself to an extent in the settled community. Previous initiatives by NGOs have always asked very little from the beneficiary in terms, as SCI attempts to create an enabling environment to disseminate solar cookers through the market, there have been resistance and questions. This alone has made some people not to purchase and benefit from solar cooking.
 - Extreme need does not always translate to quick lasting adoption – a case in point here is the obvious need observed in the refugee situation. Despite that fact that all the conditions were right for solar cooking and the dire need of the refugees, not all adopted solar cooking even though SCI was giving out the complete solar kits free of charge as well as instructions and follow – up. In our current project, the lowering of the CooKit cost, and further lowering during sales promotions did not result into significant rise in sales. This may be zeroed in on attitude as well as the fact that extreme need in many occasions if multi – pronged – it means that there are other basic

needs of the family that need satisfying before one can think of buying a solar cooker.

4. CONCLUSION

The lessons cited above and many more learnt from other solar cooker promoters will go a long way in the struggle to place solar cookers in the world market.

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