Base of the Pyramid Venture Assessment:
Solar Cookers International: Sunny Solutions Program
(Nyakach, Kenya)

MICHIGAN
ROSS SCHOOL OF BUSINESS

Team 2, Evening
BA 612, Section 451

Mathew Innes
Zenia Lewis
Rogers Morris
Laura Rosen
Valentin Uncheselu

Venture Background

Introduction

Solar Cookers International (SCI) is a non-profit organization based in Sacramento, CA that was founded in 1987. Its mission is "to assist community use of the power of the sun to cook food and pasteurize drinking water for the benefit of people and environments." The main tools it uses to accomplish this mission are its solar cookers, called CooKits, and water pasteurizers, called Water Pasteurization Indicators (WAPIs). In the beginning, SCI was a simple information exchange and educational organization on solar cooking. In 1994, it ventured into two projects where it distributed solar cookers in refugee camps in Kenya and Ethiopia. After a few years of working in the camps, SCI saw a potential business market and decided to pilot its idea with a project in Kenya it called Sunny Solutions in 2002.

Market Overview

UNICEF estimates over 2.5 billion people face a fuel-wood crisis. Deforestation continues to spread as wood is one of the primary means of cooking. Many people have to leave home in search of firewood, sometimes coming up empty, and sometimes resorting to burning wood from their own fence. Still others may use part of their food budget to buy wood or charcoal. More than 2 billion people, one third of the world, still cook with traditional biomass – wood, charcoal, etc, but in Kenya it is nearly 90% - a huge market.

Beyond simply saving trees and the environment, improvements in health provide additional incentives to switch Kenyans and others to cooking via solar energy. Most cooking is done indoors with little ventilation creating a significant source for respiratory disease. According to

the World Health Organization, this is responsible for 1.6+ million deaths annually – the second largest environmental cause of illness after unsafe water and sanitation, with which solar cookers also help. UNICEF estimates 1.1 billion people do not have access to safe drinking water. With the assistance of water pasteurization indicators (WAPI), households can sanitize water by heating it above 158° F. After five minutes, 99.9% of viable microbes capable of causing disease, such as Giardia, E. coli, Hepatitis A, etc, are killed.

Additionally, solar cookers allow for families to enjoy more nutritious foods. These meals typically require longer hours of cooking and hence more fuel, but with a solar cooker the need for more firewood is eliminated. The ability to leave meals to cook themselves is an additional benefit of solar cookers as it frees up time for other productive activities. Also solar cookers reduce the amount of time spent walking and gathering firewood.

While health, environmental, and social benefits are great incentives for the consumer, there is also economic benefit to both the consumer and business. In Kenya, forty-percent of one's income is for fuel. With the use of solar cookers, families can reduce the fuel used by 60%. By spending far less on fuel, they can spend more on other things. With an average income of $30 a month, a family spends $12 on fuel. A reduction of 60% is a savings of $8 per month. The cheapest solar cooker design costs $6 which includes materials and a fee to the seller who made the stove. On the other side, this is a return on investment for the consumer in as little as 3 weeks! With economic incentives aligned, the Kenyan market is ripe for a solar cooker venture such as SCI.

Product/Service

There are many manufacturers and retailers of solar ovens around the world. SCI with their Sunny Solutions brand collaborated with Kenyan representatives to offer their CooKit solution. The CooKit solution is one of the simplest cookers in the market and consists of: a cardboard panel which is covered with a foil reflective surface, either a long-life replaceable plastic cooking bag or 10 regular life cooking bags, and a water pasteurization indicator (WAPI). A dark pot containing the evening's cooking is placed inside the bag. The simplicity of the CooKit unit is also showcased in its serviceability. All that is needed for cleaning is wiping with a damp or dry rag. Its design is such that if the reflective surface is damaged, it can be easily replaced in the field, avoiding the need for formal servicing. The oven panel can be locally manufactured, and is compact enough to pack for travel to other areas. Initial manufacturing for the CooKit was centralized in Nairobi, Kenya. Manufacturing was later decentralized and contracted locally to reduce costs.

Business Model Design and Implementation

The Sunny Solutions project was SCI's first attempt to market solar cookers directly to consumers and SCI saw this project as a pilot for this model. As mentioned, SCI's business plan for the Sunny Solutions project was to partner with a local organization to set-up an operation to market solar cookers to Kenyans, with its ultimate goal being to hand the project off to its local partner once the business was sustainable. SCI set a goal of educating 100,000 Kenyans about solar cookers and selling at least 3,000 cookers before the hand-off of the project to its partner, which SCI anticipated would happen by the end of 2007 (5 years from the project initiation). SCI identified their local partner for the project, Nyakach Community Development

Association (NYACODA), based on the perceived ability of NYACODA to assume the project long-term. SCI chose to pilot its program in the district of Nyakach, Kenya because this district receives a lot of sunlight and has a scarcity of resources for cooking fuel. SCI's plan was to first assess the pilot through an evaluation, expand to 2 other towns, and then scale up to market solar cookers to all of Kenya. The business model to introduce and market the solar cookers is as follows:

1) They introduce the product to community leaders, women's groups, and the community at large through cooking demonstrations, primarily working with women's groups identified through local partners. They also provided a few solar cookers for trial to members of women's groups in each community;

2) They selected highly motivated women from the women's groups to be saleswomen of the cookers, called SCOREPs. SCI then trained the SCOREPs on how to use the CooKits and on how to sell them in a 4 day course. SCI used a participatory training approach, collaborating with SCOREPs to develop sales strategies relevant to their areas;

3) Once trained, the new sales representatives took on the cooking demonstration role from SCI representatives and sold the CooKits door to door for $6. For each cooker sold, the SCOREP earned $1.25. SCI supplied the women with basic marketing materials, including aprons, bags, etc. and provided the women with a commission for carrying out the demonstrations and for each CooKit sale.

SCI's partner, NYACODA, wanted to support the commercialization of the solar cookers by having 4 of its members establish shops from which to sell the CooKits. Given the slow moving nature of the CooKits and their low margins, this distribution method proved unsuccessful. SCI also sponsored radio announcements about its product . As demand grew, SCI phased out its

sponsorship of demonstrations and radio advertisements. SCI sponsored the project with a budget of $288,800 for 5 years ($57,760/year), which the project stayed within over its life. SCI hoped the project would be self sustainable, but through this pilot they discovered that they would need to subsidize a large portion of it.

Venture Analysis

Business Performance

By the end of the project in 2007, SCI had accomplished its stated goals of educating 100,000 customers about solar cooking, selling 3,000 CooKits, and keeping the project under-budget for the period. While these were the project goals determined by SCI, using the venture scorecard assessment, we identified both strengths and some major weaknesses to their design, with the biggest weakness being the lack of a scalable business model.

Design:

The venture was successful in that it was externally co-owned by SCI and NYACODA. A weakness, however, was that the partnership between SCI and NYACODA was limited. In addition to being jointly created by SCI and NYACODA, the Sunny Solutions project was designed using input from around thirty community participants including: community health workers, NYACODA, government officials from provincial administration, food and fuel vendors, CooKit users (Households), learning institutions, SCOREPS, and Archway consultants.

Implementation:

While SCI had experience with the product and introducing it to local populations from their work in Kenyan refugee camps, they had no experience marketing the product. The business model they co-created with local community members, which was a local door-to-door sales model, was not sustainable or scalable. The door-to-door sales method enabled approximately 33 CooKits to be sold per year by each SCOREP. It does not appear that they tried to improve or make the model more efficient during the 4.5 year pilot, which left them at the project's completion with an un-scalable model. Another reason sales were relatively low is that the majority of its target market reported that the price of the CooKits was too high. SCI dropped the price by $1 during the project's life, but it seems that an even greater price reduction was needed to increase sales. They did, however, somewhat achieve their goal of spreading knowledge of solar cookers by having educated over 100,000 people on the topic, which leaves the potential for future scalability. SCI had funding for 5 years to cover the Sunny Solutions pilot program. However, after the funding period ended, SCI stopped the project and decided to relocate it to a few other Kenyan towns. To start the project in other locations, SCI had to apply for grants and there was an approximate year lag before the program started again in the new locations. It does not appear that SCI has patient capital available from partners, and instead is reliant on grants to fund project expansion, which is a drawback to their grant-supported model.

Outcomes:

There was mutual value creation for all parties involved in the venture. The SCOREPS were provided with an entrepreneurial outlet where they could make some additional income.

Greater value could be created for the SCOREPS with an improved business model that enabled more sales. SCI benefited by spreading their cause that solar cooking is both economically and environmentally beneficial. Much more value could have been created for SCI if they had identified a more scalable business model. NYACODA benefited through an improved reputation in the community that came from their association with the project, and the community benefited from increased resident well-being and reduced deforestation of their community. CooKit buyers, while they did have to modify their cooking habits, were able to save time and money. The project also created a co-mingled competitive advantage with its local partner and organizations with which it worked. However, because SCI chose to exit the region of its pilot and move to a different market, SCI lost the relationships and community support it had created and has to recreate these relationships and support in its new project locations.

Poverty Alleviation Performance

The analysis of Sunny Solution's poverty alleviation performance was divided into separate categories looking at effects on sellers, buyers and the community at large using the Base of the Pyramid Impact Assessment Framework. Within each of these categories there was analysis of economic effects upon well being, capacity effects regarding intellectual/psychological and physical effects, and relational effects, which showed how the venture was creating new relationships, or removing isolation/exclusion. Overall, we felt that the project had a positive impact on poverty alleviation (Please see Exhibit 5 for our Impact Assessment Framework of Sunny Solutions).

Sellers:

The economic effects for sellers included income generation for the SCOREPs, although the additional income that they generated was somewhat small. Capacity effects included increasing the self esteem of SCOREPs, developing sales skills and educating them about solar cooking and solar energy. Relational effects included increasing social networks for SCOREPs, and additional input in household decision-making.

Buyers:

The buyers of the solar cookers benefited by saving up to 46.7% on fuel expenditures, as well as saving the time they would normally spend collecting fuel. They did not, however, realize economic benefits during the rainy season, when they were unable to use their solar cookers. As far as capacity benefits, the occurrence of ear, nose and throat diseases, as well as diarrhea were reduced by more than 70%. The solar cooker purchases also allowed for increases in buyer self-esteem. As far as relational advantages, the occurrence of cooking by males increased in 94% of households. In addition, many women also received more control over expenditures that would have previously been spent on fuel.

Community:

The community benefitted from the additional money that community members using solar cookers had to spend at other local businesses. However, fuel vendors were negatively impacted from the decrease in fuel purchases. Capacity effects included having large numbers of the Nyakach community become educated about solar cooking. Additionally, the project changed local beliefs that outside cooking was bad (dissipating beliefs that outside cooking was

linked to witchcraft and poisoning). Relational effects in the community included reducing deforestation, and reducing the uses of firewood and charcoal by 9.1% and 16.7% respectively.

Recommendations

The biggest concern we had with the project is that there was little focus on the sustainability or scalability of the business model, which we believe should have been a priority for SCI. Sunny Solutions should employ a more efficient sales model, such as the franchise model employed by VisionSpring. Additionally, SCI in its new projects is targeting urban areas instead of rural areas, which is smart as it will enable greater and more efficient sales than in rural areas. A way SCI could more efficiently achieve scalability is that they should partner with local NGOs. These organizations can help educate people about solar cookers and help assist SCI in their sales. They should also continue to spread awareness about the benefits of solar cooking in schools and colleges.

Another concern we had was SCI's exit from Nyakach, particularly because SCI did not return the project to its local partner upon exit as they said they were going to do. While it is partly understandable that SCI exited Nyakach, given their desire to try the project in an urban setting, they should have continued the project at some level there and had funding lined up to do so. They could have organized a few of their SCOREPs into a business entity and had them manage the continuation of the project upon SCI's exit.

One of the main complaints about CooKits is that they do not work during the raining season and that they do not store energy. SCI could modify the CooKit to store energy and possibly

serve as an energy source to power lights, etc., so that it would appeal to more people. We recommend that SCI get support to enhance the CooKit through partnerships with the private sector and universities.

Another reason people are not purchasing solar cookers is that people cannot afford them for two main reasons: they are too expensive in general and because people cannot provide full payment up-front. To reduce the price of the cookers, SCI should consider subsidizing them. This is an instance of market creation in which subsidies can assist in getting the market off the ground. SCI has already assessed a needed saturation level of 150,000 CooKits to be in consumers' hands to develop a stable market. If they determine the optimal price point for consumers is around $2 which is competitive to the widely use Jiko stove, then a $4 subsidy is needed. As such, SCI should look to acquiring $600,000 in capital to subsidize the 150,000 CooKits necessary to be sold to establish the market.

Additionally, while Sunny Solutions allowed people to purchase the cookers through installment payments, the problem was that the cooker wasn't provided until the final installment, so people outlaid cash well before they were able to use the cooker. To increase sales, SCI should finance customers' purchase of CooKits.

Because SCI was viewed as a non-governmental organization by Kenyans, a key barrier to the sale of CooKits was that Kenyan's expected them to be given away. SCI also contributed to this perception by selling a large number of solar cookers to World Vision, which World Vision then distributed in the Nyakach region for free. To change the community's perception about

SCI, it should have assumed the brand of its local partner. Also, SCI should have made an arrangement with World Vision for them to subsidize the cost of the solar cookers instead of World Vision distributing them for free in the region of the project.

Key Lessons

While the Sunny Solutions project provided positive results for poverty alleviation, problems with business performance make the venture's scalability difficult. The project has a lot to offer the community through its socially beneficial product; however, due to an inefficient business model, the product cannot reach a lot of the community or scale. SCI's main focus was on providing a product to serve a community need; more time spent of the business model and understanding and working through hindrances in product uptake would have helped them better provide the mutual value creation that BoP ventures require. Luckily, the lessons learned were during the project's pilot stage and should prove useful in SCI's expansion of its solar cooker project.

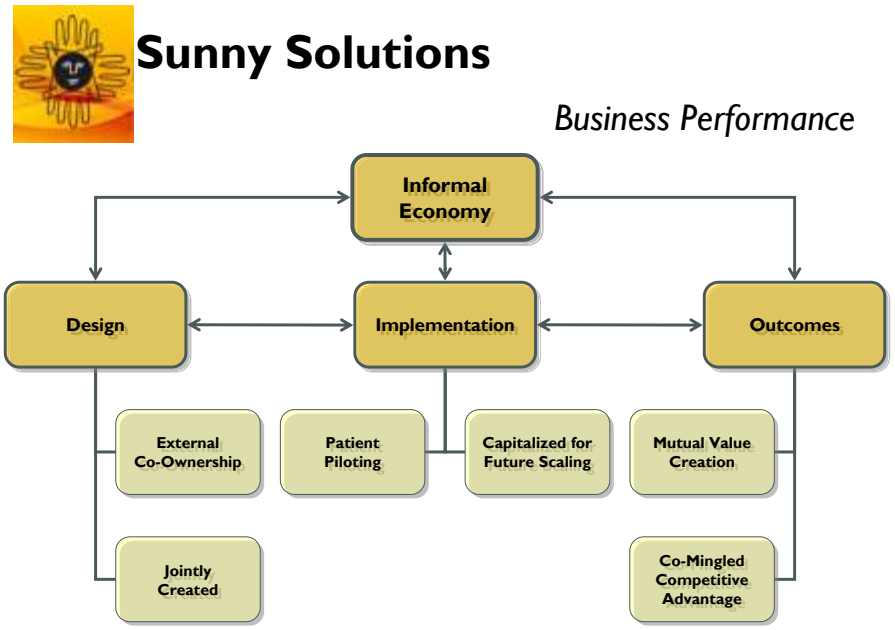

Exhibit 1: Business Performance Framework

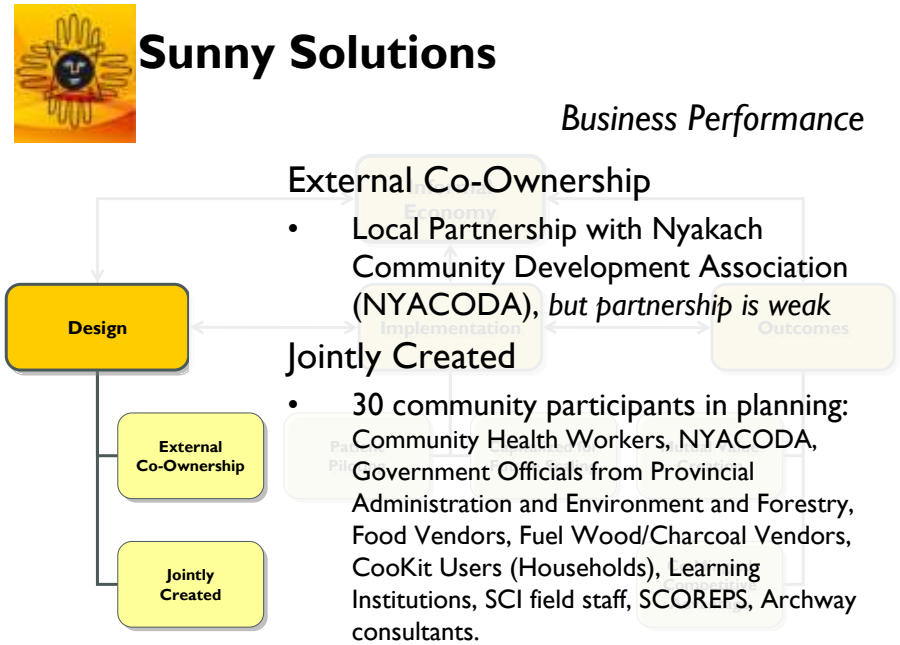

Exhibit 2: Business Performance – Assessment of Design

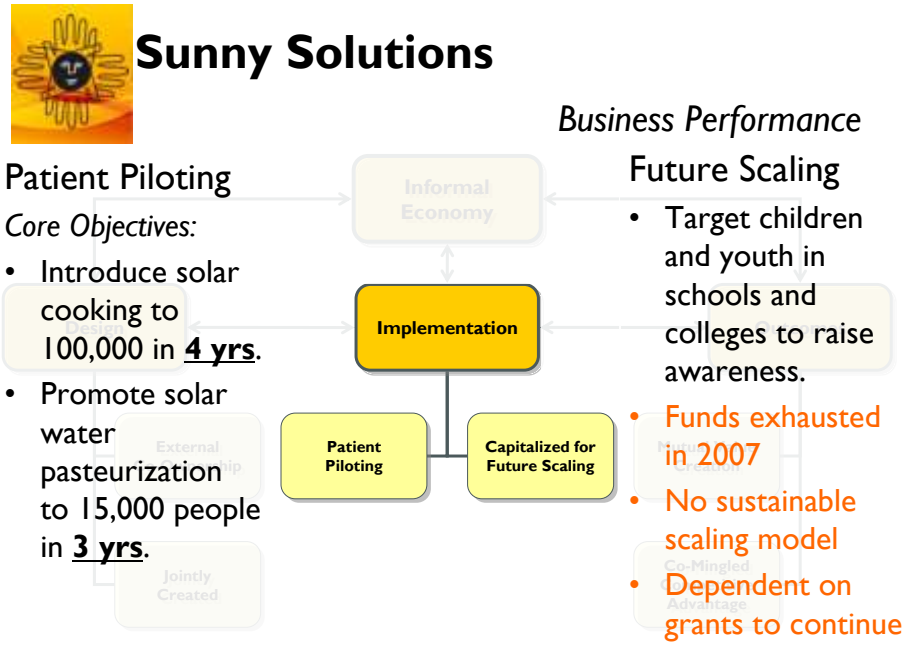

Exhibit 3: Business Performance – Assessment of Implementation

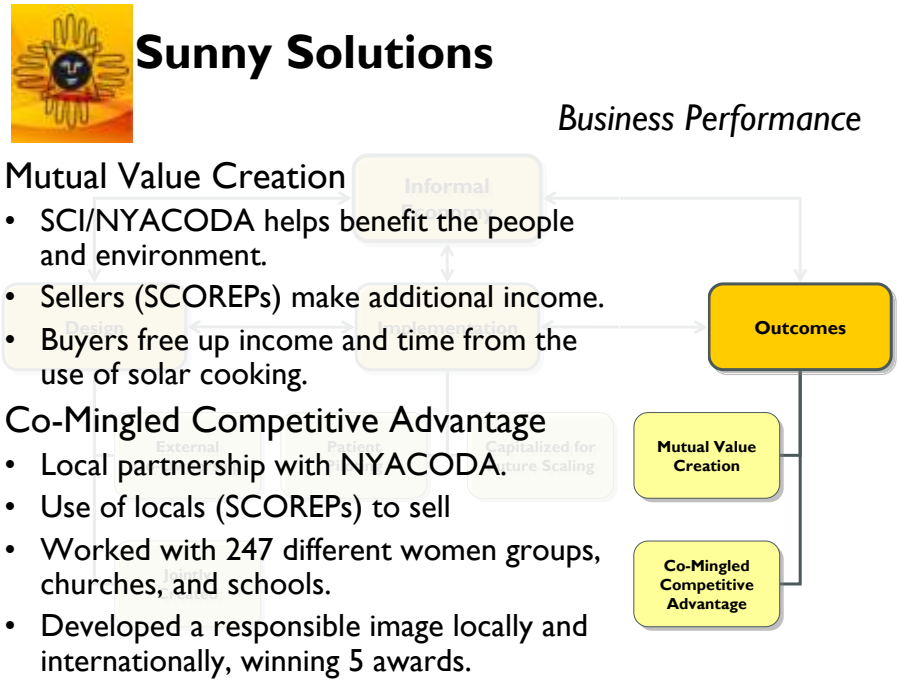

Exhibit 4: Business Performance – Assessment of Outcomes

Sunny Solutions

Poverty Alleviation Performance

	Seller	Buyer	Community
Economic	+ SCOREPs generate additional income. - Addl. income small & not stable.	+ Up to 46.7% savings on fuel ($1-3 weekly). + Time savings. - No use during rainy season.	+ Money saved on fuel is spent at local businesses. - Hurts businesses of fuel vendors.
Capacity	+ Increases reps self-esteem. + Development of sales skills. + Rep educated about solar energy & cooking.	+ ENT diseases and diarrhea reduced by >70%. + Increases user self-esteem.	+ Nyakach educated about solar cooking. + Outside cooking is generally perceived as safe; fear of witchcraft and poisoning dissipated.
Relational	+ Increased networks for SCOREPs. + SCOREPs have more input on household decisions.	+ Increased men cooking in 94% of households. +Cooks have greater control over money spent on fuel.	+ Reduced deforestation. + Firewood and charcoal use down 9.1% and 16.7%.

Exhibit 5: Assessment of Poverty Alleviation Performance

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