



Social Impact Report

Tanzania & Uganda



Global Social
Benefit Fellowship



Lindsey Allen & Serena Chan

Table of Contents

Executive Summary.....	2
Impact Patterns.....	3
Emergent Themes.....	27
Conclusion.....	33
List of Appendices.....	34
Appendix A.....	35
Appendix B.....	38
Appendix C.....	44

Executive Summary

Eighty to ninety percent of people in East Africa live without access to electricity. Most families burn kerosene, candles, and wood to light their homes and to cook food. Solar Sister strives to eradicate energy poverty through the sales of solar lanterns and clean cookstoves, but Solar Sister does more than just provide clean energy. The impact of its energy products touches every aspect of customers' lives, from business to education to household safety and more. Solar Sister entrepreneurs develop their own capacity through earned income selling clean energy technology in their communities, often investing into their own families and businesses.

To form a deeper understanding of Solar Sister's social impact in the context of East Africa, we conducted 21 semi-structured interviews with customers and 12 focus groups with Solar Sister entrepreneurs in 15 villages. After each focus group, we distributed a 33-question paper survey to each microentrepreneur to gather data in three categories: baseline monitoring and evaluation, the social impact of clean energy technology, and their local community networks. During our eight weeks in the field, we took about two thousand photos. We traveled to five East African regions in Tanzania and Uganda: Kilimanjaro, Tanga, Singida, Manyara, and Rakai.

Our research surfaced patterns of social impact such as increased productivity, purchasing power, improvement in education, and community empowerment. We crafted profiles of Solar Sister entrepreneurs and customers whose personal stories illustrate these impact patterns. In all of the stories, we found emergent themes that characterize the remarkable impact Solar Sister makes in communities. Solar Sister harnesses local expertise, and these entrepreneurs foster trust within their community, which in turn increases market penetration. For both entrepreneurs and customers, the money saved or earned increases agency and also improves their social status. Solar Sister's products are versatile in use and also create intergenerational impact.

The entrepreneur and customer profiles capture their stories, which help Solar Sister understand and share its social impact in East Africa. We integrated our survey data into Solar Sister's Salesforce account for each entrepreneur surveyed. We distilled all the photos we took into a collection of 285 to share with Solar Sister. The photos capture how both entrepreneurs and customers integrate the technology into their lives, bringing our data to life.

To continue to build a deep understanding of its social impact, we suggest Solar Sister gather more data on its customers. Our entrepreneur focus groups were successful in revealing impact patterns among specific groups. We believe that focus groups could be helpful in gathering customer data and discerning end users' commonly experienced benefits.

Productivity

Clean energy technology contributes greatly to improving the productivity of a community's economy. By enhancing productivity, profitability and income generation increase and can be reinvested into other tools or services which better the livelihoods within the community. Solar Sister customers in Rakai, Uganda demonstrate how their clean energy technology purchases have transformed their lives through increasing efficiency.

Prepared by:

www.scu.edu/millercenter



Wamayo's solar lantern has helped her tailoring business grow

Wamayo flashes a bashful smile of pride as she places her Marathoner Beacon solar lantern in front of her Singer sewing machine — demonstrating how she uses it while mending clothes during the late hours of the night. The solar lantern, purchased from a nearby Solar Sister entrepreneur in Sango Bay, Uganda, has become an integral part of her tailoring business. Wamayo put away savings for one year to purchase the Marathoner. “I am thankful for my Marathoner. I was spending 700 shillings per day for kerosene.” Wamayo’s savings from no longer using kerosene, combined with her increased profit from extended work hours, provided her with enough money to construct a new house for her family.



“The Sango Bay Twezimbe Joint Farmers Association offers practical solutions to the local poverty especially in fishing communities around Lake Victoria.”

Located on fertile farmland beside Lake Victoria, people living in Sango Bay, Uganda, rely on agriculture and fishing. Both of the village’s industries have become interdependent, empowering each other to work through environmental and resource obstacles. The farmers are all Solar Sister entrepreneurs, and they function as an entrepreneurial collective. They reinvest their profits to the Sango Bay Twezimbe Joint Farmers Association, which acts as an economic support system for the village. The fishing communities located around Sango Bay have become this group’s most consistent customers. The fishermen purchase the Marathoner Beacon solar lanterns so that they can construct fishnets at night — a time-intensive process necessary to enjoy fruitful fish production during the day. During the six hours it takes to make and mount the nets, the kerosene light the farmers were previously using would often extinguish requiring them to spend more money and time to buy more kerosene. The Marathoner solar lanterns, when fully charged, provide light for up to eight hours.



“Fishermen only used to work during the day, now they have more hours to continue making nets,” explained Monday, a Solar Sister entrepreneur.

Through selling solar lanterns as Solar Sister entrepreneurs, the farmers of Sango Bay have made safe, efficient light accessible to the Lake Victoria fishing communities. When the fishermen make a decision to purchase a solar lantern, the farmers are also able to generate more income to reinvest into the growth of the Sango Bay village. The partnership between the entrepreneurial farmers and their fishermen customers demonstrates how increased productivity, as a direct result of solar energy and entrepreneurship, can benefit an entire community.



Nayebale uses her solar lantern to keep her restaurant open late at night

“Customers are excited to be able to finally be able to see what they’re eating,” Nayebale exclaims with a giggle. After four months of saving, Nayebale purchased a Marathoner solar lantern because she became weary of the kerosene fumes, which caused both her and her customers to cough and feel sick. Seeking both to keep her restaurant open late at night and a better environment for her customers, she decided to purchase a solar lantern. “I use all the money I save to keep improving the restaurant,” she explains. Nayebale walks over to the clean cookstove she bought with the combined savings and increased profit. The energy efficient cookstove uses less charcoal and keeps meals warm for longer. No longer spending money on kerosene and charcoal, as well as enjoying increased profits from keeping her restaurant open at night, Nayebale is already saving up money to buy another Marathoner solar lantern.

Purchasing Power

We discovered that purchasing power was a highly valued outcome for Solar Sister entrepreneurs dependent upon farming and agricultural business. For these women, who previously relied upon a seasonal income with no financial security, the impact of entrepreneurship and clean energy technology provided them with the much-needed agency and decision-making power to provide for their families and increase their economic welfare.

Prepared by:

www.scu.edu/millercenter



Rose and Maria were among the first entrepreneurs to join Solar Sister Tanzania

Rose and Maria are both members of a local savings group at their community bank in Hala, Tanzania. The savings group, known in Tanzania as a VICOBA, provides the two entrepreneurs with access to financial services. After they began selling clean energy products, Rosa and Maria were able to invest part of their profit into the savings group. Putting more money into the VICOBA allowed them to take out bigger loans to purchase more solar lanterns from Solar Sister. With the financial services from the savings group further boosting the entrepreneurs' business opportunity, Rose and Maria can afford to hire workers to farm their land so they can focus on their entrepreneurial activities.

The community feels happy for Rose and Maria for bringing light to their homes. Rose and Maria's customers are primarily fellow women farmers, who use the lights at night for taking care of the home and protecting their animals. Now that so many people have become Solar Sister customers, thanks to Rose and Maria, there is no longer a demand for the harmful alternative to clean energy technology. Local shops in Hala no longer sell kerosene.

Maria is happy to be able to easily pay for school fees and home expenses without having to worry about getting money from her husband. She feels Solar Sister entrepreneurship is an important opportunity for women. "Most women are responsible for the family and home care. Solar Sister makes paying those expenses easier."

Rose, a single mother of 11 children, dedicates one day a week to selling solar lanterns. On the other days, she maintains her fruit and meat business with the help of farmers she hired to

handle her crop. After selling solar lanterns for one year, she knows she can count on harvest months — June, July, and November — to bear the most solar purchases. “I feel happy to be a strong, powerful business woman who can support myself.”

Prepared by:

www.scu.edu/millercenter



“Without this income, we don’t have the power to decide what to buy.”

Fatuma, Grace K., Mwanaidi, and Grace M. are all apart of a women’s savings group in Mforo village outside of Mwanga, Tanzania. The savings group is comprised mostly of female farmers who need access to loans to cover daily expenses they cannot afford to pay on a consistent basis. Often, women must ask their husbands for money to cover the costs of children’s education, clothes, and food for the family. When the Mforo village chairman approached the savings group about Solar Sister entrepreneurship, the four women were attracted to the prospect of economic opportunity dedicated to serving women’s needs.

After becoming Solar Sister entrepreneurs, the four women no longer have to worry about covering the cost of home expenses. “If I wasn’t selling solar lanterns, I wouldn’t be able to support my children’s educations,” said Grace K. With the money they make from selling clean energy technology, the Mforo women can put away savings for emergency funds — a sense of economic security for their families they had never been able to attain before.



"My income. My decision."

Solar Sister entrepreneurship has given the four Solar Sisters the power to decide what to buy. When asked how their husbands were adjusting to the change, the women laughed. "The men are happy. We are all happy. They are no longer bothered by us for money and we don't have to wait for their approval," said Fatuma as she smiled confidently. "This business has added to our income. We feel like we have reached the next stage of development."

Education

One of the biggest motivations behind solar lantern purchases for both Solar Sister entrepreneurs and customers is education. Entrepreneurs who are teachers often find it rewarding to sell to their students' families, and they see the resulting impact in their grades. When the sun goes down, children should be able to study at night — without any health or safety risks.



Juma studies at night with the S2 solar lantern his grandfather bought from Solar Sister entrepreneur Beatrice, Juma's headmistress

“We wanted to serve communities that are not connected, and we know this is beneficial for our students. The lights help them perform,” explained Beatrice, who has been a Solar Sister for one year. Beatrice is a headmistress of a local school in Muheza, Tanzania. After seeing a Solar Sister demonstration, she felt obligated to become an entrepreneur, knowing solar lanterns would help her students perform better in class. She and another teacher at the school, Mpaji, borrowed money from their savings group “Unity is Power and Separation is Awakeness” to begin selling the lights. They found entrepreneurship fitting seamlessly into their daily activities. The teachers spend a few minutes during each school assembly to advertise to their students. Mpaji and Beatrice are also able to reach families through their savings group, of which many of their students’ parents are members.

Neema, another Muheza teacher, was once a student of Beatrice, and she is now a fellow Solar Sister entrepreneur. She also believes the trust factor plays a great role in convincing parents that solar lanterns are an investment in advancing their children’s education. “Parents trust me because they know I am a school teacher, and I care about their children,” she said.

The teachers explain how the lights are used in most families. Mothers use the lights initially for cooking and tending to the home. Once they finish, they give it to their children to study. If the family buys multiple lights, then they typically can light an entire room and accomplish multiple tasks at once. The family then often reinvests the savings, the money they

used to pay for kerosene, back into their children's education — tuition, school supplies, and food for lunch.

The teachers work with the families closely even after the purchase to ensure that the lantern is serving its purpose. When students began reporting that their lanterns were being stolen while left to charge outside their homes, the teachers told their students to start bringing their lanterns with them everyday to charge them at school.

“What’s special about Solar Sister is that now we can help the people who need these products the most, but couldn’t access them before,” said Beatrice. Mpaji agreed, saying many of her customers appreciated Solar Sister’s reliability and accessibility. The two teachers felt that the Solar Sister brand had become well-known and trusted in their community. “Solar sister has created love between us and our students” said Mpaji.



Natalia is a mother, farmer, and tailor. With the S2 lanterns, she can safely cook dinner and her children can study at night.

Before she purchased S2 solar lanterns, Natalia's children were having issues in school and health. "They couldn't study confidently. When they used kerosene, they started coughing and choking from the smoke." Natalia decided to buy battery powered flashlights as an alternative, but she became frustrated when the flashlights broke with no warranty to return them. When Solar Sister entrepreneur Rose introduced her solar lanterns to Natalia, she was intrigued by the idea of a reliable, safe solar lantern with a two year warranty and a receipt. Natalia also felt comfortable purchasing the light from Rose, a friend and neighbor for many years.

Natalia bought one light to test it out, wanting to make sure the technology lived up to Rosa's claim. She saved her earnings from selling her vegetable crop and working as a tailor to buy two more lanterns, one at a time. Her children's grades improved two times their previous scores. Natalia feels happy her children can safely hold their source of light and move around with it when they study.

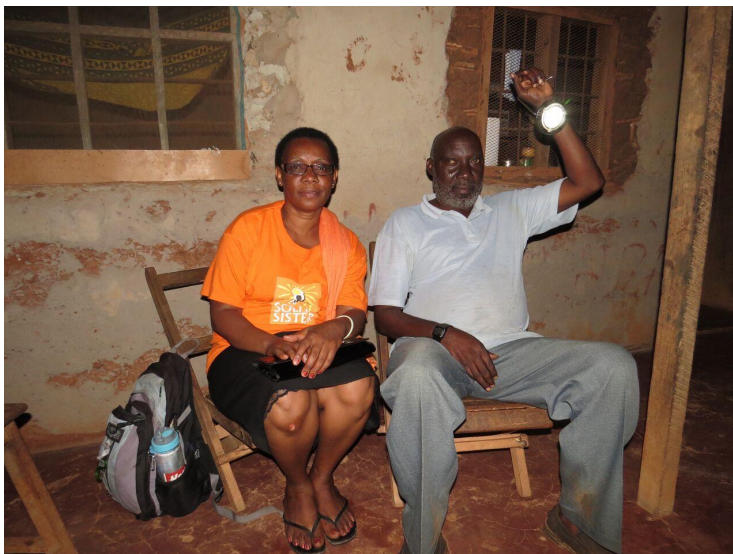
Prepared by:
www.scu.edu/millercenter

Community Empowerment

Solar Sister entrepreneurs recognize the power of last mile distribution. When they see communities suffering from a lack of access to light, they are motivated to distribute clean energy technology and bridge that gap. The entrepreneurs walk for miles and to sell and deliver lights, devoted to seeing their communities thrive.

Prepared by:

www.scu.edu/millercenter



Athumani, right, sits with Solar Sister entrepreneur Beatrice, left, as he shows off his S2 lantern

Athumani is the chairman of Mamboleo, a village in Tanga, Tanzania. When he noticed that a nearby school's headmistress, Beatrice, was selling solar lanterns as a Solar Sister, he decided to purchase a lantern. He liked the idea of a light brighter than kerosene, and one he could easily carry around. He felt he could trust Beatrice, knowing her as honest and easy to contact should he have issues with the product.

After purchasing the solar lantern, Athumani is no longer burdened with extra energy costs. His daily routine became "smooth and straightforward", unlike before when he constantly had to interrupt his day to buy kerosene. In fact, Athumani saves 18,000 Tanzanian shillings per month from switching to solar energy.

Athumani now owns four solar lanterns, all purchased from Beatrice.

Beatrice sat with Athumani and they discussed the impact his purchase had on their community. "Once people saw the village chairman using the light, more people began asking to buy solar from me. Customers would go talk to him about the lights before buying them," explained Beatrice.

Athumani nodded in agreement. "When people visit me with their problems, they see the lights and decide to save money to buy lanterns for themselves," he said. He feels happy to see people in his village using solar and saving money like him.

Athumani laughed as he recalled his relatives jokingly threatening to steal all of his solar lanterns if he wasn't careful enough. Now, whenever he saves up to purchase more lanterns from Beatrice, he sends them to his relatives.



The Shashui entrepreneurs listen to a customer, center, explain how solar lanterns have changed her life

Mwanahawa was approached by her village chairman with the opportunity to become a Solar Sister entrepreneur. After hearing a presentation from a Solar Sister sales associate, the village chairman began looking for entrepreneurial women. Mwanahawa was a good choice. Excited at the opportunity to earn income while also making a difference for her friends and neighbors, Mwanahawa decided to become a Solar Sister.

As she began selling the lanterns, she began to see the impact the light had on her customers' lives, and she felt her relationship with the community grow stronger. She became determined to see her entire village gain access to safe light. Mwanahawa realized she could not accomplish this alone, and she sought out to recruit other women in her village to become Solar Sister entrepreneurs. It was not long before she found five of her neighbors to become Solar Sisters as well. As a Solar Sister, Mwanahawa spreads both light *and* entrepreneurship throughout her community.

Thanks to the Solar Sisters of Lushoto, Tanzania, every house in their village uses solar-powered lanterns. "The smoke from the kerosene is gone. Wherever we go, we see solar lights hanging now," said Mwanahawa.



Evelyn feels proud to represent Solar Sister and bring light to the Handeni community

Evelyn laughs joyfully as she picks up her Solar Sister business bag to demonstrate how she gets customers' attention. "This is how I hold my bag. I take it everywhere I go," she said. Evelyn and her husband were the first Solar Sister entrepreneurs in Handeni village. "Before Solar Sister, it was hard to get by," explained Emmanuel, husband of Evelyn. The Handeni community is mostly dependent on seasonal farming, which makes constant expenses, like kerosene costs, difficult to keep up with.

After becoming Solar Sister entrepreneurs, Evelyn and Emmanuel shed their kerosene burden and helped other people in their community do the same. They became well-respected in Handeni, now regarded with a higher status. Soon, after seeing the pair's success, more Handeni villagers became solar entrepreneurs. While it is difficult for the farmers of their community to put aside the little money they have, customers approached them and told them they were saving up as best they could to purchase a solar lantern.

The Handeni entrepreneurs try to sell outside their village as well. They walk up to eight hours every week to sell the solar lanterns at market days in a nearby town. They also contact school teachers so they can arrange to hold presentations at local schools.

Emmanuel emphasized that everyone in the community is happy to see people become Solar Sister entrepreneurs. "The men in this community believe that women should have this opportunity because they suffer the most from not having light at night."

Gone are the days of the kerosene accidents that crushed the Handeni spirit. "We're happy to see people being able to sleep at night with no worries," said Evelyn.



Solar Sister entrepreneurs Anna, Deodata, Yohana, and Melea

“I became a Solar Sister because I saw it as an opportunity for the whole community, not just me,” explained Deodata, an entrepreneur from Msemembo, Tanzania. At night, Deodata opens her home up to students who cannot yet afford to buy the lights, so they can still study at night and saving money from not purchasing kerosene.

The Solar Sister entrepreneurs of Msemembo village have become well known and revered in their community for their dedication to spreading light. Over half of their community has switched to solar and has seen a reduction in living costs from the absence of kerosene. Even customers who originally bought a solar lantern from another retailer approach the entrepreneurs because their product from the retailer does not last and does not have a warranty.

“We get more customers when they see the lights in the community,” said Yohana, another Msemembo entrepreneur. When people see their friends and neighbors using solar that they bought from a trusted community member, they feel more confident purchasing the technology.

Yohana, a man, sometimes gets teased for being a “Solar Sister”. “I trust this program so much, I don’t care what people say,” he said with a laugh and a shrug.

Anna, who has been an entrepreneur for a year, is happy to see light bringing more security to the area. Anna and her customer, Yudith, point out people now sit outside and enjoy each other’s company at night, simply because they have light. “Before, people couldn’t even play pool at night, now you can always find them outside,” said Yudith.



Moshi saved up her own earnings to purchase the cookstove which she says reduces smoke emissions, cooks faster, and uses half the amount of wood as before.

Moshi has sold more than 250 solar lanterns and clean cookstoves, and gone through five receipt books in her first year as a Solar Sister entrepreneur. She first heard about Solar Sister during a presentation at a FarmAfrica meeting. She was persuaded by the need for clean energy. “Our community is far from the road, and we feel forgotten by the government,” Moshi said. “We thought let’s take it upon ourselves to get access to clean energy.”

Once they became Solar Sisters, Moshi and Mwanaidi set a goal to eradicate energy poverty for their entire village. However, they soon realized it was too big a task for only two women, so they recruited two others to help them. The four women began selling clean energy technology through their strong, established networks. They made sales at village gatherings, the local mosque, market days, and at their savings group meetings.

The Solar Sister entrepreneurs found a demand for both solar lanterns and clean cookstoves. The solar lanterns help relieve the high cost of kerosene, while the cookstoves reduce the number of weekly trips a woman must make to gather firewood.



“I feel happy and confident because I’m no longer a goalkeeper. Whatever I want to buy, I can buy.”

The women estimate that 75% of their village now uses solar lanterns, with the majority of the lanterns bought from the Solar Sister entrepreneurs. “Our community is happy that we supply solar,” said Mwanaidi (*).

Regina, one of Moshi’s customers, feels that her family’s life has significantly improved after they bought their first S2 solar lantern. “I’m thankful that Moshi came to me from far away to sell this product. I’m happy the lantern still works,” she said. Regina’s church congregation often gathers at her house to do their night time prayer safely. Occasionally Regina lends her lanterns to the church for Christmas and other major holidays.

Sitting by Moshi’s farmland, Regina pointed past the fields at a distant mountain top, “I want to become a Solar Sister entrepreneur too, so I can serve the people behind that hill.”



Customer Juliana speaks proudly of the Solar Sister entrepreneurs Hilaria, Luciana, and Petronila and how they serve as role models in their village of Mwada.

The basket weavers of Mwada village were some of the first Solar Sister entrepreneurs in Tanzania. They discovered the Solar Sister opportunity through the African Wildlife Foundation, one of Solar Sister's partner organizations in Tanzania. The women were intrigued by the idea of simultaneously attaining income security, while also helping their village. Now, not only are the women gifted artisans, but they are also respected business women.

The cost savings and newfound security in the village, as a result of the spread of solar energy, has garnered praise for the Solar Sisters. When walking through the village at night, solar lanterns can be seen hanging from most homes. The women are perceived as life savers in their community. "Our names have changed. People call us Mama Solar," said Hilaria with a giggle. Last year, Hilaria won a Solar Sister bicycle for being one of the top selling entrepreneurs in Tanzania.

Mwada is currently suffering from a water scarcity crisis. Through spreading access to light, the Mwada entrepreneurs helped their community gain access to water as well. "Fetching water is very expensive, but now since I'm no longer spending money on kerosene, I can afford to fetch water," explained customer Juliana.

Solar Sister entrepreneurship has fostered love and trust in Mwada. "The community prays for us because we have brought a different lifestyle to their homes," said Basilisa.

Juliana, who has been a long time customer and fellow basket weaver, smiles proudly at the Solar Sister entrepreneurs. She explains that villagers feel comfortable purchasing the technology because they can feel the care behind the work. "These ladies are smart. They love each other. The community sees them as strong business women," said Juliana.



The Sango Bay Twezimbe entrepreneurs seek “to mobilize and empower communities for sustainable environment conservation and mitigation of climate change effects” through promoting clean energy technology.

The Solar Sister entrepreneurs of the Sango Bay Twezimbe Joint Farmers Association are unique — the ten entrepreneurs sell as a collective. The entrepreneurs keep 40% of their profit for their own individual use, and 60% of their profit is put into a savings bank. The money put in the savings bank is used for a community lending program to help Sango Bay villagers work together to address costly challenges or pay for community improvement project. The money is loaned to community members when needed, such as if a roof breaks or if someone wishes to invest in a solar lantern. The loan is paid back over time.

“Sango Bay Solar Sister entrepreneurs sell solar lanterns to help address the community’s needs,” explained Monday, a Solar Sister entrepreneur and the leader of the farmers’ organization. “As a group, we all face the same challenges. It’s harder to achieve goals individually. If we work together, it’s easier to help each other out as a whole.”

The Sango Bay entrepreneurs take their work very seriously. They love selling clean energy technology as Solar Sisters, and they aim to educate all of the nearby villages on how it can improve livelihoods. “We don’t just go out dumping solar on people like other companies. We educate and connect with customers. We learn their energy challenges and teach how solar can benefit,” said Monday.

Within the group, each entrepreneur is assigned to a separate area or nearby community. They do not mind traveling distances and provide feedback to each other to help grow as entrepreneurs. “We love our customers,” said Glory. “We know how solar lanterns have

improved our lives, so we're willing to travel to help others. We are energy advisors. We don't wait for people to come to us, we go out to the people."

The Sango Bay entrepreneurs are among the top selling entrepreneurs in Uganda. "We're just doing what Solar Sister did for us. Spreading information and helping people," said Fred.

Emergent Themes

We have interpreted the patterns we observed and collected to establish six distinct themes that characterize the unique impact Solar Sister makes in lives of individuals and their communities.



Solar Sister harnesses local expertise.

Solar Sister achieves last mile distribution through partnering with women in their local communities. These women are the entrepreneurs who sell solar lanterns and clean cookstoves to their family members, neighbors, and other fellow community members. Solar Sister entrepreneurs leverage their local networks, and it is this element which sets Solar Sister apart from other clean energy social enterprises. Through a bottom-up integration of clean technology, Solar Sister recognizes and celebrates the local expertise of their in-country team, from the entrepreneurs fostering customer relationships to the country manager recruiting sales associates to help scale Solar Sister to new regions of the country. These women personally know their communities, understand how business works in their specific context, and develop close relationships with customers to best meet their needs.

Solar Sister fosters community trust.

All of the local connections Solar Sister entrepreneurs form with customers rely heavily on trust. When asked why they purchased the product from the Solar Sister entrepreneur rather



than other sellers (such as retail stores), customers responded consistently, “because I *trust* her.”

Often entrepreneurs sell to people they know and have personal relationships with such as family and friends. They also sell to people of similar professions, for example to other farmers, to other teachers, or to other business people. Many of these trust relationships were formed before the woman started working as a Solar Sister entrepreneur.

The entrepreneurs also sell to many people they do not know personally. These forms of trust relationships may come through word-of-mouth recommendation or groups and organizations. To foster trust with customers, Solar Sister entrepreneurs write receipts for every purchase, provide a two-year warranty for the product, and leave their mobile number and contact information with their customers. It is not uncommon for entrepreneurs to gain new customers through past customers whose friends and family members see the solar lantern or clean cookstove and want to purchase one for themselves. Here, customers often say they purchased the product “because it works.” In this case, the trust lies more in the product and in the existing customer’s user experience.

Finally, entrepreneurs may also form customer relationship through organizations such as their financial savings groups or larger groups such as village communities. Savings groups have inherent trust components as each individual contributes his or her personal funds to a communal pool, which individuals can pull from in times of emergency or for large purchases. In addition, customers from savings groups have the additional capital for clean energy products that other people may not have. In larger groups such as villages, entrepreneurs often introduce themselves

to the village chairman. After sharing the purpose of Solar Sister and community-wide benefits of clean energy with the leader of the community, the entrepreneur can form stronger relationships with the entire community, with the support of the village chairman. In this way, trust forms through leaders to the rest of the community.

There is also tremendous trust within the Solar Sister team, from entrepreneurs to sales associates to country manager. Their trust in each other and their faith in Solar Sister's mission create a strong bond that many within the social enterprise call "sisterhood." After all, Solar Sister's values are *sisterhood*, *trust*, and *grit*. Trust networks make Solar Sister more than just a clean energy distributor. Solar Sister forms a visible, positive presence in communities. Entrepreneurs, sales associates, and country managers have the power to transform entire communities one trust relationship at a time.



Solar Sister promotes women's agency.

With their earned income, Solar Sister entrepreneurs can invest in their families, their homes, their businesses, and themselves. Women have the purchasing power in their households now that they do not need to rely on their husbands for money to pay for their children's tuition, groceries, or household goods. They have the capital to invest into savings groups or even build their own businesses. Rather than being subject to the harms of kerosene, women now have control over the sources of energy they use in their homes. Solar Sister fosters women's agency in their homes and in their communities.

**Solar Sister elevates social status.**

Solar Sister gives women power, both in the form of clean energy and agency. This power flows into many parts of their lives—their occupations, their families, their social lives. Some women can now afford to hire laborers to work in the fields, so that they may now spend more time furthering their own businesses. With greater purchasing power, women also develop greater independence from their husbands, no longer relying completely on them for finances. Light also gathers people. Many customers say their neighbors come over more often in the evenings because they now have light.

Solar Sister creates access to products that customer use in diverse and innovative ways.



One d.light S2 lantern can result in safe cooking, studying, keeping a shop open late at night, farmland irrigation in the early morning hours, and even keeping cattle safe from predators—all within one household. Solar Sister entrepreneurs create access to clean energy technology in many last mile communities. After purchasing the product from Solar Sister, customers find ingenious ways to bring light into other parts of their lives. As well, the solar lanterns with mobile charging capabilities allow people to conveniently keep their mobile phones charged, which leads to increased business productivity. Customers prefer the lanterns to larger solar systems because of their mobility and affordability. With just one solar lantern, Solar Sister touches the lives of many people in many ways.

Solar Sister impacts people across generations.



Education. Economic stability. Clean energy in homes. These factors affect everyone in the home and community from the infant to the elderly. Solar Sister bolsters children's opportunities to succeed in their education toward a brighter future. With economic stability, families can afford tuition, nutritious foods, and health care for the young and old. Family members no longer have to breathe in the toxic fumes of kerosene or face the risk of an open flame now that they have clean energy technologies providing safe, bright light.

Conclusion

From the Solar Sister entrepreneurs and customers we met with in Tanzania and Uganda, we captured their personal stories in narratives which exemplify the social impact Solar Sister achieves including: increased productivity, purchasing power, opportunities for education, and community empowerment. We further assessed these patterns through a thematic analysis.

We recommend Solar Sister continue to gather stories and data on its impact, especially at the customer level. During our time in the field, we spoke with customers predominantly in one-on-one semi-structured interviews. However, we believe that the focus group method may also help uncover commonalities shared among customers in future research. In our focus group sessions, we were able to identify significant characteristics of social impact shared by specific groups of entrepreneurs such as the value of purchasing power and agency for women farmers.

Other areas of further research Solar Sister may consider exploring include a deeper understanding of the social impact of clean cookstoves, ways to overcome barriers entrepreneurs face, and the importance of trust networks for entrepreneurs. Clean cookstoves are relatively new to Solar Sister's market, and there are different models of clean cookstoves sold by Solar Sister entrepreneurs in different countries. Understanding successes and challenges in the sales of clean cookstoves may help Solar Sister expand this market across multiple cultural contexts. To further market penetration, Solar Sister may consider exploring specific barriers its entrepreneurs face. From our focus groups, Solar Sister entrepreneurs shared their challenges such as lack of transportation to reach new and/or existing customers. One common element Solar Sister entrepreneurs attributed as key to their sales is trust. The trust relationship between customers and entrepreneurs fosters trust in the product. Trust networks contribute to word-of-mouth marketing from customers to their friends and families. In continuing to understand ways to deepen its social impact, Solar Sister may further spread light, hope, and opportunity to communities living in energy poverty.

List of Appendices

Appendix A: Methodology

Appendix B: List of Interviewees & SSE Salesforce Links

Appendix C: Map with Field Visit Coordinates

Prepared by:

www.scu.edu/millercenter

Appendix A: Methodology

In order to address the impact and success of Solar Sister in East Africa, we used mixed methods to gather data from both the micro-entrepreneurs and the end users. These methods were designed to collect information to better understand what population groups experience the most impact, and in what ways, as a result of Solar Sister's off-grid alternative technologies.

Surveying Micro-entrepreneurs

In the five regions we visited, we distributed fifty surveys to in order to discern information about the micro-entrepreneurs that was essential to understanding impact and contributing to monitoring and evaluation efforts. The surveys were designed in English then translated and administered in Swahili. Successful completion of the survey generally required 2-3 translators. The 33-questions on the survey were divided into four categories: Baseline Information, Social Status, Social Impact, and Networks. The data gathered from the wide range of questions will allow us to determine the Solar Sister micro-entrepreneurs' socioeconomic status and see if that variable has any effect on their entrepreneurial experience. The survey data gives us insight toward both impact output and outcomes from the micro-entrepreneurs' use of clean energy technology.

Solar Sister Survey (Handed out to each SSE)**Baseline Questions**

1. Please write your age: _____
 2. Circle one: **Married** **Widowed** **Divorced** **Single**
Please write number of children in household: _____
Do all children ages 6-17 attend school? **YES** / **NO**
 3. Name of your village: _____
 4. How long have you been a Solar Sister: _____
 5. Tribe: _____
- Social Status**
6. How many animals do you keep: _____
 7. Which animals do you keep: **Goats** **Cattle** **Chicken** **Pig**
Other: _____
 8. Do you own land: **YES** / **NO**
If YES, how many acres: _____
 9. Do you own a means of transportation: **YES** / **NO**
If YES, what kind and how many?
Car: _____ **Bicycle:** _____
 10. Do you own a mobile phone: **YES** / **NO**
 11. What are your sources of income: _____
 12. What is the main source of your income? _____
 13. What is the main profession of your husband? _____
 14. Are you part of a savings group? **YES** / **NO**
 15. Level of education? Circle one: **Primary** **Secondary** **High School** **College**
- Social Impact**
16. What source do you use for lighting before solar? **Kerosene** **Power** **Candles** **Solar**
 17. How much money did you spend on this lighting source per week: _____
 18. What source do you use for cooking? **Wood** **Charcoal** **Biogas** **Other:** _____
How much money did you spend on this cooking source: _____
How many hours do you spend collecting this cooking source: _____
 19. How many solar lanterns do you have in your home: _____

20. How many cookstoves do you have in your home: _____
 21. How many times per week do you make sales: _____
 22. What was your weekly income before Solar Sister? \$ _____
 23. What is your weekly profit after Solar Sister? \$ _____
 24. How do you use your additional income:
Education **Health** **Food** **Assets/House** **Own**
Business/Shop
Other: _____
- Networks**
25. How do you sell:
Over the phone **At home** **At work/shop** **At church** **House to house**
 26. Do you sell to strangers (people you do not know): **YES** / **NO**
 27. Do you sell to people outside your tribe: **YES** / **NO**
 28. What is the profession/business of your customers? _____
 29. Do you make more sales to people you know (friends & family) or to strangers?
Friends & Family / **Strangers**
 30. Is it easy or hard to sell to strangers? **Easy** / **Hard**
 31. Is it easy or hard to sell to friends? **Easy** / **Hard**
 32. Do you have returning customers [customers who buy more products]? **YES** / **NO**
 33. Has your network expanded as a result of being a Solar Sister? **YES** / **NO**

Focus Groups

At each of the twelve East African villages, we conducted focus groups with Solar Sister entrepreneurs. Each focus group was moderated via translation by a Solar Sister Country Manager and/or a Solar Sister Sales Associate, and ranged from 2-9 micro-entrepreneurs. We found that each group shared a commonality – often occupation, savings group membership, or tribe. It was more difficult to facilitate discussion in the bigger groups or groups where there was one older member who seemed to serve as the spokesperson for their particular group. The focus group interview questions were designed to gather information on the commonly experienced benefits of clean energy technology within the Tanzanian geographic market. Often, we found the micro-entrepreneurs sharing narratives about how entrepreneurship had transformed their life, as well as their motivations for selling clean energy technology to their local communities. Since there were commonalities within each group, we found that the shared variable often influenced the entrepreneurial experience. For example, the Muheza teacher group is motivated to sell solar lanterns to their students because they see remarkable grade improvement when the children can do schoolwork at night; many of the farmer groups discussed the significance of having consistent purchasing power, and being able to reinvest additional income into their daily expenses.

	Kilimanjaro	Tanga	Singida	Manyara	Rakai
Focus Group Total	1	3	2	4	2
Participant Total	4	13	10	13	14

Semi-Structured Interviews

We held a total of 21 semi-structured interviews with Solar Sister customers. The customers usually shared the commonality of the micro-entrepreneur group from which they were obtained. The customer interviews shed light on the time spent saving funds for clean energy technology, why they decided to purchase the technology, what they use the technology for, and how that use has transformed their lifestyle. Most customers we interviewed were enthusiastic to answer our questions and shared narratives about how their purchase had impacted their life. One of our most consistently successful interview questions was asking the customer why they chose to purchase their technology from a Solar Sister and why they specifically trusted that Solar Sister. We also inquired as to who has the most influence on clean energy purchase decisions in the customers' households and why. We asked how purchasing solar lanterns and/or clean cookstoves had affected their social status. The answers we received gave us more perspective on the nature of decision making at the community level. At times, when the micro-entrepreneurs brought their customers to the focus group, we had to incorporate our customer interview questions into the focus group discussion. These interviews turned out to be one of the most valuable parts of our research, as Solar Sister is beginning to seek out more social impact data on customers.

	Kilimanjaro	Tanga	Singida	Manyara	Rakai
Customer Total	0	9	5	4	3

Appendix B: List of Interviewees & SSE Salesforce Links

First Field Visit

Kilimanjaro & Tanga

1. Mforo Village; Mwanga, Kilimanjaro
 - a. SA: Victoria Mfinanga
 - i. 4 SSEs
 1. Grace Kimaro: <https://na9.salesforce.com/001E0000018nuKx>
 2. Mwanaidi Msuya: <https://na9.salesforce.com/001E0000014JGCO>
 3. Grace Mbwambo: <https://na9.salesforce.com/001E000001DmtRK?srPos=0&srKp=001>
 4. Fatuma Mziray: <https://na9.salesforce.com/001E000001E3jJt?srPos=2&srKp=001>
2. Shashui Village; Lushoto, Tanga
 - a. SA: Halima Nasoro
 - i. 5 SSEs
 1. Yusto Karata: <https://na9.salesforce.com/001E0000019hTEF?srPos=0&srKp=001>
 2. Mwanahawa Musa: <https://na9.salesforce.com/001E0000013QpRr?srPos=0&srKp=001>
 3. Bisawa Yusphu: <https://na9.salesforce.com/001E000001FOk4J>
 4. Zuema Hemedi: <https://na9.salesforce.com/001E000001FOj4g>
 5. Rehema Husseni: <https://na9.salesforce.com/003E000001MAaUZ?srPos=3&srKp=003>
 - ii. 2 customers
 1. Veronica
 2. Mawayuma
3. Mamboleo Village; Muheza, Tanga
 - a. SA: Halima Nasoro
 - i. 3 SSEs
 1. Beatrice Baji: <https://na9.salesforce.com/001E0000011XFjA?srPos=8&srKp=001>
 2. Mpaji Mabula: <https://na9.salesforce.com/001E0000011XGzk?srPos=0&srKp=001>

3. Neema Michael:
<https://na9.salesforce.com/001E000001411MC?srPos=2&srKp=001>
- ii. 2 Customers
 1. Athemani
 2. Juma Shomari
4. Handeni Village; Kwamakao, Tanga
 - a. SA: Irene Shirima
 - i. 5 SSEs
 1. Emmanuel Laizer: <https://na9.salesforce.com/001E0000013aYHU>
 2. Evelyn Emmanuel: <https://na9.salesforce.com/001E0000011XIoE>
 3. Namayani Julisi
 4. Rehema (Juma) Bakari:
<https://na9.salesforce.com/001E000001KHuou?srPos=0&srKp=001>
 5. Emeliance (Mbailwa) Lerumbe:
<https://na9.salesforce.com/001E000001965pX>
 - ii. 5 customers
 1. Upendo
 2. Namayani
 3. Acacia
 4. Wamnyala
 5. Momdongo

Second Field Visit

Singida & Manyara

5. Saranda Village; Manyoni, Singida
 - a. SA: Regina Massawe
 - i. 6 SSEs
 1. Esther Illumbo: Salesforce link not found
 2. Tabu Mwabahi:
<https://na9.salesforce.com/001E000000x37DW?srPos=0&srKp=001>
 3. Commando Madani:
<https://na9.salesforce.com/001E000000rui6P?srPos=0&srKp=001>
 4. Violet Kahana:
<https://na9.salesforce.com/001E000000wwUXg?srPos=5&srKp=001>
 5. Anna Sabuni:
<https://na9.salesforce.com/001E000000uSFaC?srPos=2&srKp=001>

6. Yusuf Pama:
<https://na9.salesforce.com/001E000000rJetH?srPos=0&srKp=001>
6. Msemembo Village; Manyoni, Singida
 - a. SA: Regina Massawe
 - i. 3 SSEs
 1. Melea Andrea: Salesforce link not found
 2. Yohana Roberth:
<https://na9.salesforce.com/001E000001GbWzo?srPos=1&srKp=001>
 3. Deodata Kingo:
<https://na9.salesforce.com/001E000000wW7LF?srPos=4&srKp=001>
 - ii. 5 customers
 1. Abdallah Mlewa
 2. Jeremiah Miotun
 3. Rachel Mowdea
 4. Happiness Maungo
 5. Yudith Mwambi
7. Mawemairo; Babati, Manyara
 - b. SA: Caroline Gilbert
 - i. 4 SSEs
 1. Mwanaidi Mohammad:
<https://na9.salesforce.com/001E000001Co9cF?srPos=3&srKp=001>
 2. Mwajuma Ismail:
<https://na9.salesforce.com/001E000001E3xB6?srPos=2&srKp=001>
 3. Moshi Mohammad:
<https://na9.salesforce.com/001E000000w2nek?srPos=1&srKp=001>
 4. Mwanaidi Ramadhani:
<https://na9.salesforce.com/001E000000wGTEI?srPos=2&srKp=001>
 - ii. 1 customers
 1. Sada Shaban
 2. Regina Joseph

Third Field Visit

Manyara

8. Mwada; Babati, Manyara
 - c. SA: Caroline Gilbert
 - i. 5 SSEs

1. Petronila Gobi:
<https://na9.salesforce.com/001E000000dhuMA?srPos=1&srKp=001>
2. Luciana Martini:
<https://na9.salesforce.com/001E000000dhuM5?srPos=0&srKp=001>
3. Basilisa Monjare:
<https://na9.salesforce.com/001E000000envWF?srPos=0&srKp=001>
4. Basila Mossongo:
<https://na9.salesforce.com/001E000000fb3Wy?srPos=0&srKp=001>
5. Hilaria Paschal:
<https://na9.salesforce.com/001E000000dhuHK?srPos=0&srKp=001>

- d. 1 customer
 - i. Juliana Augustin

Fourth Field Visit

9. Hala Village; Babati, Manyara
 - e. SA: Caroline Gilbert
 - i. 2 SSEs
 1. Rose Simoni:
<https://na9.salesforce.com/001E000000lQ7l7?srPos=24&srKp=001>
 2. Maria Amuari:
<https://na9.salesforce.com/001E000000mjvGI?srPos=13&srKp=001>
 - ii. 2 customers
 1. Priscilla Peter
 2. Natalia Noeli
10. Sharimo Village; Babati, Manyara
 - 1) SA: Caroline Gilbert
 - i) 2 SSEs
 - (1) Elizabeth Michaels:
<https://na9.salesforce.com/001E0000001lnQeX?srPos=14&srKp=001>
 - (2) Ester Paolo:
<https://na9.salesforce.com/001E00000014V9FU?srPos=8&srKp=001>

Fifth field visit: Rakai, Uganda

11. Sango Bay

a. SA: Angel Nanyonjo

i. 9 SSEs

1. Paul Mawerere: <https://na9.salesforce.com/001E0000018IzvL>
2. Monday Justas: <https://na9.salesforce.com/001E0000018IzvL>
3. Charles Katwaaz: <https://na9.salesforce.com/001E0000018IzvL>
4. Fred Kazigo:
<https://na9.salesforce.com/003E000001PKRos?srPos=3&srKp=003>
5. Moses Sseaeuka: <https://na9.salesforce.com/001E0000018IzvL>
6. Mary Kiconco: <https://na9.salesforce.com/001E0000018IzvL>
7. Glory Kyomugisha: <https://na9.salesforce.com/001E0000018IzvL>
8. Joyce Nakabuye: <https://na9.salesforce.com/001E0000018IzvL>
9. Florence Nakamajako: <https://na9.salesforce.com/001E0000018IzvL>
10. Justine Naleegba: <https://na9.salesforce.com/001E0000018IzvL>

ii. 3 customers

1. Nabunye Garit
2. Wamayo Byateddy
3. Nayeabale Sifa

12. Nyendo Public School

a. SA: Angel Nanyonjo

i. 5 SSEs

1. Gwokoya Ioya Lhodah: <https://na9.salesforce.com/001E0000018sL7J>
2. Mirembe Laidi: <https://na9.salesforce.com/001E0000018sL7J>
3. Milly Ssentmu: <https://na9.salesforce.com/001E0000018sL7J>
4. Virungi Florence: <https://na9.salesforce.com/001E0000018sL7J>
5. Bukirwa Gertrude: <https://na9.salesforce.com/001E0000018sL7J>
6. Cate Nalucoda: <https://na9.salesforce.com/001E0000018sL7J>

Appendix C: [Map](#) with Field Visit Coordinates

Entrepreneur Meeting Points



Nyendo Public School
Teachers Association

Sango Bay

Sharimo

Halla

Mwada

Mawemairo

Msemembo

Saranda

Shashui

Malesi/Adeni

Muheza

Mamboleo

Mforo

Regional Offices



Solar Sister Tanzania Office



Solar Sister Uganda Office

