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Social entrepreneurship as a response to the energy crisis, climate change and women's inequality in developing countries: Women managed solar cooker production business in Rural Haiti

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SOCIAL ENTREPRENEURSHIP AS A RESPONSE TO THE ENERGY CRISIS, CLIMATE CHANGE AND WOMEN'S INEQUALITY IN DEVELOPING COUNTRIES: WOMEN MANAGED SOLAR COOKER PRODUCTION BUSINESS IN RURAL HAITI.

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ABSTRACT

SOCIAL ENTREPRENEURSHIP AS A RESPONSE TO THE ENERGY CRISIS, CLIMATE CHANGE AND WOMEN'S INEQUALITY IN DEVELOPING COUNTRIES: WOMEN MANAGED SOLAR COOKER PRODUCTION BUSINESS IN RURAL HAITI.

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In developing countries such as Haiti, households heavily rely on charcoal and wood to satisfy their energy needs. The unsustainable use of these fuels accompanies adverse health and women's inequality impacts. As well as have severely altered Haiti's environmental landscape. Solar cooking is one clean energy alternative to these issues. Despite its multiple benefits; solar cookers have had little traction in developing countries. Most research is focused only on technical improvements of solar cookers. This paper looks at how the utilization of solar cookers can positively impact the problems facing Haiti due to traditional cooking methods (1) environmental, (2) energy crisis, and (3) women inequalities. The implementation plan developed focused on increasing the use of solar cookers by empowering women through employment in a solar cooker manufacturing facility in Haiti.

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ACADEMIC HISTORY

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DEDICATION

I would like to dedicate this research to my husband, Dr. Jeffery A. Williams. Without your encouragement, I would not have started this process. You believed in me when I didn't believe in myself. Thank you for your unwavering love, sacrifice and late nights by my side. You are my inspiration.

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INTRODUCTION

My decision to pursue a dual MBA/ Community Development & Planning degree did not come in a moment of blinding revelation, rather as a result of a variety of life experiences. Subsequent to graduating from Bryant University, I participated in multiple short-term missions to Haiti, Dominican Republic, Kenya, Zimbabwe and Zambia. However, it was during my last trip to the Dominican Republic that clarity for my future educational and professional goals emerged. While in the Dominican Republic, I traveled to a very poor village to provide people with basic things like nonperishable food, clothing and water. It was evident that the villagers received word beforehand of our arrival as they all gathered in one area waiting patiently for us. As I, along with members of my team, distributed bags of rice, personal care products and gallons of cooking oil, I became increasingly uncomfortable with the futility of our efforts. Overhearing a comment made by one of the recipients, "we have waited all year for you to come again" helped me quickly answer my question in the negative. This village, similar to so many others I have visited (nationally and internationally), needed more than a temporary fix. They needed to be empowered.

This past May, I had the opportunity to participate in a Clark University "Field School on Rural Energy Crisis, Agriculture-based Livelihoods, Climate Change, Poverty, and Conflict in Rural Haiti." This field school provided the exposure to impact the energy crisis on agriculture-based livelihoods, poverty, climate change, and conflict in three villages (Merceron, Tri Marche, and Bas Beon) in Haiti. During the trip my Professor brought with him a solar cooker and used it to cook a meal. At first blush the solar cooker seemed like a natural fit for those living in Haiti especially because of the fuel issues and immense deforestation. From discussions we had with woman farmers and villagers' regarding the issues they faced, having to find or purchase fuel to cook with, the saturation in the agriculture market, climate change. But it wasn't until I heard the woman farmers say they wanted to be empowered to learn a new skill, work in an industry other than agriculture that I knew there was a space for the solar cooker in the Haitian marketplace. It was this experiences that led me to the point of this capstone project.

BACKGROUND

Two countries share Hispaniola Island; one-third is Haiti, and the other side is the Dominican Republic (Factbook, 2015). Although the countries share the same island, they are light-years apart in development, economy and environmental landscapes. The country has suffered a long history of colonializm, first under Spain, who had original claim to the island. Later by the French who arrival was met with resistance because both countries wanted to colonize the nation (Henley, 2010). Under the colanialilization of both the Spanish and French, the people were dehumanized and forced in to slave labor. The demorilizing start to the country was continued over the years with government corruption that has led to poverty and labeled as the poorest country in the Western hemisphere (Henley, 2010). Haiti has a population of 10 million (Factbook, 2015). More than half of the population is under the age of 25 with an average life expectancy of only 62 years. The country's GDP is 7.84 billion and is consistently declining per capita GDP since its independence in 1954 (Sletten, 2004). A definition of poverty is "scarcity, or the lack of a certain amount of material possessions or money" (Merriam-Webster, 2011). Furthermore, poverty can be absolute or relative. Relative poverty is a superficial comparison of an individual and a societal standard of economic status. Absolute poverty is what the mass

majority of people are confronting in Haiti; inability to meet basic needs such as food, clothing and shelter (Marniesse, 2003). Haiti is certainly facing absolute poverty with most Haitians surviving on less than $2 per day, and 56 percent are living on a $1 per day, leaving more than 75 percent of the population in poverty (Henley, 2010). Rural areas are suffering from even higher poverty rates (Sletten, 2004). Most families struggle to satisfy their fundamental needs. Due to the massive economic collapse with the decreased or failed export industry, income is derived mostly from self-employment through farming, albeit subdivided small plots, and 75 percent are unemployed (Henley, 2010). The lack of opportunity combined with 75 percent unemployment compels many to sell drugs, turn to extortion and other illegal activity in efforts to support their families. Two hundred years of corruption have led to a lack of development, resulting in insufficient infrastructure. The absence of development adversely impacts the people in many ways: stress borne of poverty, limited resources and of the dearth of sufficient medical care, making the average life expectancy in Haiti only 62 years. Resource shortages and inadequate medical care have led to "80 deaths for every 1,000 live births" (Henley, 2010), and 1 in 16 women run the risk of dying during childbirth (D'Adesky, 2010). Nonexistent infrastructure has also created poor public services; ill-equipped fire stations and corrupt police departments that require bribes to deliver services.

There are many reasons why the country is in this condition:, "slavery, revolution, debt, deforestation, corruption, exploitation and violence, poverty, illiteracy, overcrowding, no infrastructure, environmental disaster and vast areas with no rule of law (Henley, 2010)." In addition, there are leaders more concerned with increasing their personal wealth at the expense of the people rather than fighting for the wellbeing of the country.

Haiti's tropical and mountainous landscape make it prone to natural disasters which has also contributed to its poor living conditions and major environmental issues (Sletten, 2004). The country of Haiti is usually synonymous with a poor, aid-dependent country; upwards of 40 percent of the country's budget is foreign aid that has not been adequately utilized to help the people or develop the necessary infrastructure (Henley, 2010). Haiti was already in a dismal state with a weak government and high poverty rate; multiple storms have only further distressed the country, especially after the 2010 earthquake responsible for the deaths of three hundred thousand people. The immense structural damage in Port-au-Prince left 1.3 million people displaced and left to live in makeshift tents, no clean water and no apparent relief (Arumala, 2012). While trying to recover and rebuild following the 2010 earthquake, Haiti was hit with 2011's Hurricane Irene followed by 2012's Tropical Storm Isaac (Affairs, 2015).

In 2012 media headlines were overwhelmed by the devastation Hurricane Sandy left behind. The destruction in the US was so widespread most media outlets did not report on Hurricane Sandy's fury on Haiti. Still reeling from previous storms, this additional desolation left an aftermath still unrepaired today. Hurricane Sandy's heavy rains swept through Haiti, leaving swollen rivers overrunning neighborhoods. Mudslides killed more than 450 people. The storm did not claim many lives; however, it did destroy 27,701 homes affecting 39,058 families (USAID, 2015). The vast floods left behind 90,354 hectares of inoperative farmland covered with rocks and debris (USAID, 2015). Seventy-five percent of harvestable crops were destroyed, 64,000 livestock killed, and strong winds disrupted fishing industries only further impacted food and economic security (USAID, 2015). Water systems were also destroyed leaving 1.5 million highly food-insecure (USAID, 2015) and without clean drinking water (Henley, 2010). Roads and bridges were severely damaged, and in some cases completely washed away. The repetitive storms have taken thousands of lives as well as farmland. The fear is any new catastrophe will completely paralyze the country.

The effects of the natural disasters in Haiti has exacerbated the countries financial challenges. Most of the financial attention has been lost to

corruption or rebuilding infrastructure. Electricity in the country has significantly suffered because of the lack of financial support (Worldwatch, 2013). The institutional framework is weak from inadequate maintenance, causing lack of capacity. The removal of the secretary of energy has also prevented attention to the energy crisis. The next three sections will discuss energy crisis, deforestation and women's inequality.

energy crisis

Natural disasters contribute considerably to the structural issues facing Haiti. However, they are not the only culprits for general abasement. Energy and environmental concerns are equally responsible for the current penurious state of the country.

Haiti's energy industry was exposed as a serious underlying hindrance to their development. Electricity is the country's primary energy supply – there is no petroleum production, refinery capacity or reserve. However, 12.4 thousand barrels of petroleum are imported and consumed every day (USEIA). Coal and natural gas, both common energy sources in many parts of the world, are not utilized at all – no production, import or export (USEIA). The primary use of energy is for cooking, heating, then lighting (Sletten, 2004). A monopoly, Electricité d'Haïti (EdH) is the sole generator, transmitter

and distributor of electricity for the entire country. Seven million people had no access to power before the earthquake. After the quake and ensuing storms, only 25 percent of the population has access to electricity consuming 330 million kilowatt-hours (kWh), approximately equal to the total amount of electricity of 30,000 US households (USEIA). The grid is so deficient that outages can last for hours to days at a time. It is estimated that there are 3 - 10 hours of available electricity per day (USAID, 2015). Many Haitians feel entitled to electricity but can't afford it and choose to steal it, 12.5 percent of it is obtained illegally (USAID, 2015). These makeshift connections are very dangerous to establish but are protected by the communities that create them. Unfortunately, the government has not been able to get the problem under control or enforce the laws. EdH workers encounter attacks if they try to disconnect illicit networks. Gross mismanagement and greedy political influence has created the energy crisis (Worldwatch, 2013).

The scarcity of resources has forced people to find alternative fuels for cooking, heating and lighting; many have resorted to using dirty fuel, resulting in significant environmental ramifications (Sletten, 2004). Charcoal is their number one solution. The producing and selling of charcoal has been relentless on the forest leading to a deforestation problem. Stripped

mountain slopes cannot absorb or slow the water brought by natural disasters (Factbook, 2015).

deforestation

The degree of environmental degradation Haiti has experienced is unequal in the entire world (USAID, 2015). Of its original forest, 97 percent has been lost with only a minuscule 3 percent left standing (Factbook, 2015). When land is converted permanently from forest to non-forest usage, the reduction in the abundant resource of woods results in deforestation (Gillis, 1996). Deforestation is a complex and severe issue. Trees are crucial in many ways to the health of the land and the environment, assisting with absorption of a sizable portion of the world's carbon (Gillis, 1996). They are important sources of biodiversity on earth. The water cycle is also supported by forests, absorbing rainfall to produce water vapor released into the atmosphere as well as soil being anchored by tree roots (Factbook, 2015). Soil erosion and lack of fertility are endemic in Haiti. Without trees, much of the topsoil is free to wash or blow away. Also, slopes and mountainsides have eroded preventing the retaining of rainwater. The nation loses 1.35 tons of soil per square kilometer annually (Encyclopedia, 2016). As a result, extreme flooding and landslides have acquired many villages and lives (Factbook, 2015). Poverty is a strong contributor to deforestation. Colonial

domination has led to centuries of agricultural exploitation. Export commodities, the current harvest of timber, and the education and health of local people was ignored for centuries (McClintock, 2003). A growing population puts pressure on limited reserves of soil and clean water. The lack of resources for poor people has exponentially increased the demand for cooking fuel. For over 60 years Haitians have been cutting down the forest to produce charcoal for cooking (Sletten, 2004). This practice is a daily activity for survival but has left the land barren, further stressing the environment.

Although plans have been created to explore reforestation initiatives, lack of financial resources continue to hinder implementation. Although the government is not in the position to assist with major environmental issues, many organizations are working to help the people, even if in small numbers. The hope is that this project will curb current dependency on burning charcoal and wood by introducing alternative cooking fuel options, domestic activities will change, in turn helping to preserve the remaining forest. The United Nations has reported that Haiti is losing 3 percent of its forests every year (United Nations, 2015). Deforestation has been linked to climate change, such as a discernible rise in temperatures and the loss of seasonal rain predictability, has led to prolonged droughts,

erosion of the nutrients in the top soil causing vegetation growth problems which further exacerbates the state of the agriculture industry (Gillis, 1996).

The insufficient supply, inadequate service of electricity and high fuel costs has forced people to find alternative cooking sources. With no environmental regulations or subsidiaries for alternative fuels, Haiti became reliant on unclean fuels; wood or charcoal are the primary choices for preparing food. Charcoal, made by burning wood and other carbon-rich substances in an oxygen-proof furnace, became popular quickly.

> *"The United Nations' Food and Agriculture Organization estimates that more than 3 billion people lack adequate cooking fuels. (3 billion people is 2,400,000,000 people - nearly 8 times the population of the United States of America.) In developing countries, many people spend as much money on fuel to cook their food as they spend on buying food. Others spend over 40 hours a-week gathering scarce firewood. Total regions have been stripped of trees (Solavore, 2015)."*

dependency on charcoal

Charcoal makes up 20 percent of the rural economy and 80 percent of the country's energy supply (Institute, 2013). Thirty-nine percent of the people use charcoal, and the remaining 32 percent use wood (Institute, 2013). Timber and charcoal fuel options are very costly, especially charcoal, and

make up the largest household expense for the majority of families in Haiti. Families must forgo basic staples to purchase the necessary cooking fuel to feed their families. Men are working the farms to create income; women are left to care for the children and travel to gather wood. The time spent collecting wood prevents women from working, focusing on their children or getting an education.

In addition to being costly, these fuels also emit smoke and other pollutants, which are dangerous when inhaled, leading to serious health issues, severe illness, and often result in premature death. These types of fuels also significantly contribute to deforestation, making a simple activity like cooking time-consuming and dangerous, a growing issue specifically burdening women.

As the Haitian forest continues to be depleted women and girls must travel increasingly greater distances from their villages to find sufficient supply. These voyages often take several days with women carrying loads of wood strapped to their backs or balanced on their heads. The danger is not only in the distance traveled, but also in the competition for this scarce resource, as well as the foraging on others' territories, leading to violence that includes sexual assault and rape.

Firewood is the sole option for fuel in rural areas, while urban dwellers depend on charcoal. The lack of energy supply can be directly linked to this over use of charcoal. Left with no other options wood and charcoal has eliminated the forest making it harder to find the materials needed to cook. This over consumption of charcoal is unsustainable as there are less than 3 percent of forest remaining. Women are the primary cooks are responsible for collecting the fuel required. The unsafe conditions force women to walk in groups when gathering firewood. These trips sometimes take two or more hours (Programme, 2010)

gender inequality

Haiti has a long history embedded with racism, sexism, and deep seeded gender inequality. A male dominated government whose corrupt focus has left the country riddled with economic, energy and environmental challenges has left women to bear the repercussions. Women are marginalized limited to being caretakers of the family, for cooking, cleaning, caring for children, assisting with physical labor on farms and meeting the needs of their husbands. Haiti's precarious economic conditions have facilitated cultural and legal discrimination and increased sexual exploitation of women and girls. The government perceives women

as weak and treat them as objects (Horton, 2012). The complex bureaucratic relief agency process dismisses the needs of women, eliminating medical services. This continued mistreatment of women perpetuates the sexual and gender-based violence they suffer (Horton, 2012).

Consequently, women have suffered disproportionately, exposed to higher rates of poverty revealed through: economic inequalities, limited material possessions, lower income, and gendered roles, norms, and responsibilities (Horton, 2012). The illumination of Haiti's systematic gender-based exclusion came after the 2010 earthquake. Male-dominated relief agencies provided no state support for women. Diminishing medical and other services forced women to negotiate sexual favors to meet basic needs and obtain access to supplies and services. The invisibility of women is blatant, so much so the government did not include or recognize women's opinions, perspective or gender at all in the assessment of natural relief and reconstruction (D'Adesky, 2010). It is easy to draw correlations between the self-perpetuating cycle of extreme poverty and the absence of safety and security and the rapid deterioration of Haiti's natural environment, (D'Adesky, 2010).

The catastrophes in Haiti created humanitarian disasters; adverse impact on the climate negatively impacting farming output, further draining already scarce water resources, and problems such as deforestation is exacerbated. These issues have made women particularly vulnerable because of their role in providing food, water, and firewood for the household. Climate change has set back the progress in women's rights and undermined development. Women are the ones left demeaning themselves, begging for food and help at every level: community, agencies and the government, often having to exploit their children to gain sympathy. To guarantee their families eat, women must put themselves and their children at risk. They endure treacherous conditions, physical harm, and suffering the loss of needed material goods to find the supplies required to keep their families intact.

Half of Haitians depend on the agriculture sector for their livelihoods (USAID, 2015). The overcrowded marketplace consists of competition selling the same product - primarily sorghum, banana, and mango, leaving the market demand-constrained. People buy food on a daily basis in small quantities because of the lack of refrigeration. Produce often spoils before there is enough demand. The creation of an alternative energy industry is long overdue. The U.S. government is committed to working with the

Haitian government to develop and fund projects that will help preserve Haiti's environment. By creating environmentally friendly, income-generating activities for Haitians (USAID, 2015), the goal is to reduce charcoal dependency. This would also reduce forest destruction. Reducing or resolving these two issues will automatically increase the protection of women.

Although the environmental and social issues linked to cooking fuel are many, these initiatives are a statement to potential resolutions. A comprehensive approach is needed to address all of the issues. This project will investigate how utilizing solar cookers aligns with government's vision for the country, contributes to the decrease in deforestation, increases the quality of life for women and their families, and establishes business development.

solar cookers

Solar cookers are not new inventions - they have been around since the 1700s (Kansil); however, as fuel options (oil, gas, electricity) became readily available, the use of solar cookers diminished. Now that the world is in an energy crisis and these 'traditional' fuel sources are becoming scarce, solar cookers are reemerging not only in underdeveloped countries, but in

advanced countries like the USA.

There are many developing countries that are dependent on wood an charcoal for fuel that have been introduced to and are successfully using solar cookers. 250 Large commercial grade solar ovens are used in the Dominican Republic to feed children at school (Sun Oven). Tibet has benefited from solar cookers for over 25 years, with over 70,000 in use (Development, 2007). There are projects in Cambodia, Nepal, Tanzania, India. All places that are fuel poor and sun rich. In Lower Nyakach, Kenya Africa is using solar cookers and have successfully begun to change the dynamics of life:

- "5,784 people using solar cookers and drink safe water packages
- This has save up to 434,010 kg of fuel wood, the equivalent of 781 tons of CO_2 emissions, or the amount of electricity used in 107 US homes in one year (Solar International)"

What is a solar cooker? It is an appliance that absorbs energy from direct sunlight to heat, cook food and pasteurize water (Kansil). The black interior of the cookers grasps the sunlight to turn its energy into heat and creates a setting similar to a greenhouse, raising temperatures high enough to cook

food (Kansil). There are three primary types of solar cookers: heat-trap boxes, curved concentrators (parabolic), and panel cookers. A heat-trap box is the most used solar cooker usually accommodating multiple pots. The curved concentrators provide the quickest methods of the three for cooking. This kind of stove is often enormous and used for preparing food for large groups such as schools, or large institutions (Kansil). Lastly, a combination of the box and parabolic cookers is the panel cooker.

The introduction of solar cookers to Haiti, hopefully, will play a part in reducing the amount of firewood needed daily, and optimistically increasing environmental benefits by halting the rate of deforestation in the country. It will further reduce the number of dangerous trips women make to collect fuel. One of the most meaningful attributes of this Solar Cooker Project is its ability to provide women the opportunity to contribute to their homes financially.

SOLUTION

Solar cookers are complementary technology rather than a substitute for domestic energy supply. Haiti's readily available sun and limited fuel create the perfect environment for solar cookers (Factbook, 2015). Although solar

cookers cannot solve fuel issues in Haiti, their use will positively impact issues to:

- Provide an option for hot food and safe, drinkable water
- Decrease the cost of household fuel expense
- Reduce deforestation and air pollution
- Empower women to produce and sell solar cookers.

Much of the customary infrastructure in the western nations is too costly to implement in a traditional sense. The successful future development of the country will need to be innovative and unconventional. Haiti averages 7-9 hours of sunlight per day (Institute, 2013), a resource readily available and underutilized. The solar industry is trending but limited in its use. Solar power is most frequently used to charge cell phones, but it still has a long way to go before it will be considered standard technology. With the significant infrastructure challenges, solar power is the most practical resource the country could use to supply consistent, reliable energy. The concept of solar cookers is not new; it has been a fruitful industry in many sun-rich countries. Solar cooking is simple to use, safe, and a convenient way to cook food without consuming unclean fuels. Providing an alternative cooking fuel for fuel-scarce regions opens the door to improved health, empowerment, and better preserved local environments. This, too, will

reduce women's exposure to violence and sexual assaults when traveling in an effort to keep their families fed. This alternative method of cooking is more than a choice — it is a crucial component in the fight for sustainability, and it will improve the quality of life for some of the poorest people on the planet.

Solar cookers are truly a product for all Haitian citizens. Given the level of poverty, an alternative cooking source not only will save people money, but it will also provide a means of income for those who market them. Recognizing that charitable contributions have not and will not be the solution to changing economic conditions in Haiti, our hope is to assist their communities in becoming more sustainable. By empowering them in a number of ways: create jobs for women, thus, we have inquired as to what community needs are, and listened to the people's concerns. We have decided to create jobs that empower women to be valuable contributors to their households in more ways than only caring for the home. We want to do something, even if small, to assist in lifting individuals out of poverty.

This solar cooker social venture partnership will build a plan to raise awareness, promote employment opportunities, and train people how to use solar cookers -all while creating a production business. Partnerships

between Solavore, FOHNDAD will be developed to move the project forward. Solavore is a socially conscious company currently producing solar cookers for their US market. Their mission is to "provide healthy cooking-fuel alternatives to wood, charcoal, kerosene and coal for women in sun-rich countries (Solavore, 2015)." However, Solavore does not have the capacity to make international work the focus of their business, making our partnership ideal. This association is important because Solavore already has the intellectual property and manufacturing rights for the solar cooker. The in-country partner, FONHDAD, is a nonprofit organization aimed at modernizing Haitian agriculture through the introduction of modern agricultural practices (FONHDAD, 2015). FONHDAD has already begun to empower women in the farming industry; however, they are discovering women who are a part of the program desire empowerment in other sectors (FONHDAD, 2015). In the past, solar cookers have not caught on in other countries due to lack of funding, and usually, in an effort to keep the cost extremely low, the quality of the product has been inferior. Non-governmental organizations (NGO) distribute the solar cookers throughout local communities without adequate planning for cost, cultural understanding and adaptability. Hence, our social venture partnership provides a pathway for a full accounting of these issues. Our plan includes raising awareness, promoting economic opportunity and appropriate

training for use of the product - all while creating a production business. Again, why is this project unique? Our social venture will not just arrange for a donation, we will educate, train, and empower women.

This past May, I had the opportunity to participate in a Clark University "Field School on Rural Energy Crisis, Agriculture-based Livelihoods, Climate Change, Poverty, and Conflict in Rural Haiti." This field school provided exposure to impact the energy crisis on agriculture-based livelihoods, poverty climate change, and conflict in three villages (Merceron, Tri Marche, and Bas Beon) in Haiti. While there, we conducted household surveys, geographic information systems mapping, brainstorming on the development of sustainable sources. This collaborative project was with FONHDAD. Our team assisted with FONHDAD's agriculture day where we demonstrated how a solar cooker worked. There was tremendous interest in developing a better understanding of the usefulness of a solar cooker. It was at this point I realized there was a market for such a product in Haiti. A sun-rich country, Haiti's environment is in trouble due to deforestation, a result of pillaging forestry to be used for cooking fuel. From discussions with local women, I found they want to be empowered to do more. They want to be valuable contributors to their families and communities. This project is an opportunity to give Haitian women exactly what they desire.

Haiti would be the first beta country for the project. However, the long-term goal is to successfully build a model that other nations could reproduce. For instance, there is currently interest in Zambia, Africa. I would like to develop a woman-managed solar cooker production business in Rural Haiti to provide an alternative cooking option. The result will combine social entrepreneurship and collaboration to assist with the implementation of a working operation in Haiti. The goal is to empower women through training to understand how to produce, use and sell solar cookers. It can be challenging to measure the success of a social venture as easily as a for-profit business, where there are clear industry standards that define success, such as profitability. However, our focus will be on blended returns for determining our success. We will need to look at the profit as a by-product of the production of the solar cookers. Additionally, we will measure the impact on community and culture as a whole; that is arguably harder to quantify. In other words, we will use the "triple bottom line" – people, planet, and profit - as our measurement:

- People: the number of women trained in producing solar cookers and households that own the product
- Planet: within the focused villages, examine decreased use of dirty fuel and the money spent to purchase it.

- Profit: from sales, part-time and full-time jobs created

Solar cookers are very different than charcoal. It will take some time to educated on the benefits of using an alternative to charcoal. Nevertheless, the realization of no additional cost to use a solar cooker will persuade consumers. The ramped deforestation will force people to find alternatives.

CASE STUDY REVIEW

The following section reviews a case study that supports the concept of solar cookers assisting in changing the landscape of Haiti. This particular case study was conducted in South Africa. Although the landscape differs in Haiti, the countries have many similar issues. The field work in South Africa demonstrated the following benefits: "the use of solar cookers resulted in appreciable fuel and time savings as well as increased energy security for households using commercial fuels (Wentzel, 2007)."

There were some additional successes revealed as well as best practices. The research confirmed that solar cookers can provide monetary fuel savings for households purchasing charcoal to cook. "during the first phase of the solar cooker field test, overall fuel savings were 38percent. During the

placement period, test users saved almost 60 tons of wood, more than 2 tons of gas, and over 2000 L of paraffin (Wentzel, 2007)." Various factors influence "solar cooker use rates" including environment, the cooker or the user (Wentzel, 2007). Issues with the cooker itself – use of better materials, is imperative to the perceived value as well as how long the product will last. When working with populations that do not have money to purchase another cooker, they see value in the lasting use of the cooker. Also, with the cooker itself, the black posts that came with the cooker were not painted well and the paint was easily rubbed off – this caused many issues including the lack of use. "Available data indicated that on average, 17 percent of purchasers/owners of solar stoves stop using them after about 1.5 years after purchase (Wentzel, 2007)." There was also evidence that the cooker is a time-saver for women which led to them becoming more involved with their communities. Women were also able to use the cookers to produce products that could be sold for money. A few of the benefits uncovered during the study are as follows:

- "Money saved was given to schools;
- In Huhudi, hawkers saved money to buy fuel and food to sell;
- In poorer households where a larger percentage of monthly income is spent on fuels, more money is available for buying other fuels, thereby enlarging the fuel mix available for the household;

- By cooking with a solar stove, fossil fuels or electricity are available for other activities or energy end-uses. For example, instead of using paraffin for cooking, it can be used for lighting;
- Other organizations such as women's groups, savings clubs and clinics benefited from household savings (Wentzel, 2007)."

One of the great successes of the South African research, although not the primary focus of the work, is that women were able to utilize the cooker for income- generating activities. Below are a few examples.

- "Mrs. Sebola, a tavern/she been owner in Huhudi: She used the cooker to prepare meals which she sold in her business. Her main business was selling beer. As a businesswoman, she immediately realized that she was saving money by using the solar cooker, and she was the only person in the field test to spend R1000 to purchase the cooker at the end of the test period (Wentzel, 2007)."
- Another example is "a solar powered bakery established in the Eastern Cape by Sun Ovens International. A village-size Sun Oven with LPG back-up was installed to employ HIV-positive women for baking bread (SCI, 2004). The project was reported to be functioning well, although no further information was published (Wentzel, 2007)."

CONCLUSION

The development of clean energy business models promotes long-term economic, environmental and social benefits. Solar cookers are not the sole solution to Haiti's problems, however, they do help reduce impacts. The use of solar cookers decreases dependency on charcoal. The reduction of charcoal use allows forest to be repopulated reducing deforestation. Solar cookers also, eliminate the need for women to travel long distances to find fuel supply and lowers the expense of buying charcoal weekly.

There is conclusive evidence that people introduced to and make use of solar cookers resulting in income generation are more likely to continue using the cooker rather than reverting to dirty fuel. The business model in Appendix A is one option for income-generation, which could potentially lead to other micro-enterprises. At a minimum, the hope is the use of solar cookers become a natural part of Haitians everyday life.

Following is the operational plan for a women-run Solar cooker manufacturing plant as well as how it will be implemented and executed.

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APPENDIX A

BUSINESS PLAN

Sun Top Solar Cookers

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SOCIAL IMPACT

Sun Top Solar Cookers is a woman managed solar cooker production business in rural Haiti. This plan is a social entrepreneur's response to the gender inequality and energy crisis in Haiti.

The population of Haiti in 2015 is approximately 10 million people (Factbook, 2015), more than half under the age of 25, with an average life expectancy of 62 years of age. The country's GDP is $7.84 billion (Sletten, 2004). On average, Haitians are surviving on less than $2 per day, and 56 percent are living on a $1 per day with more than 75 percent of the population living in poverty (Henley, 2010). Haiti is often synonymous with an aid-dependent country. Upwards of 40 percent of the country's budget is foreign aid that has not been adequately utilized to help the people or develop the country (Henley, 2010). This became especially apparent after the 2010 earthquake when over 300,000 people were killed. The immense structural damage in Port-au-Prince, left 1.3 million people without homes, clean water, and with no apparent relief (USGS, 2012). It was estimated that 250,000 homes were lost in the earthquake, and 30,000 commercial and governmental buildings were damaged or collapsed (Arumala, 2012). While trying to recover and rebuild after the 2010 earthquake, Haiti was hit with additional storm's that increased the damage; Hurricane Irene in 2011,

followed by 2012's Tropical Storm Isacc (Affairs, 2015), and later that same year, Hurricane Sandy. These storms swept through Haiti, with heavy rains and winds, overflowing rivers, and flooding neighborhoods. The massive floods left behind inoperative farmland covered with rocks and debris. Roads and bridges were severely damaged, and in some cases, completely washed away. Water systems were destroyed leaving hundreds of thousands of people without food, drinking water, or shelter (Henley 2010).

The energy crisis has complicated Haiti's recovery of Haiti and is central to the problems of deforestation and gender inequality. Seven million people had no access to power before the earthquake; after the earthquake and ensuing storms, only 25 percent of the population have access to electricity 10 hours per day, of which 12.5 percent of which is obtained illegally (USAID, 2015). The primary use of energy is for cooking is charcoal (Sletten, 2004). The insufficient supply of electricity has forced people to seek out alternative cooking sources. Dirty fuel (wood or charcoal) is the primary choice for preparing food. While 39 percent of the people use charcoal, the remaining 32 percent use wood (Institute, 2013) leading to deforestation (Sletten, 2004). As of 2012 Haiti has lost 97 percent of its original forest (Institute, 2013). This practice is a daily activity for survival but

has left the land completely barren. Wood and charcoal fuel options are very costly and are the largest household expense for the majority of families USAID estimates fuel is 30 percent of a household budget (USAID, 2015). Families must forgo needed items to purchase the necessary cooking fuel to feed their families. Unfortunately, these fuels are not only costly, but they also emit smoke and other pollutants that are dangerous when inhaled. Haitians are very conscious of the increasing shortage of wood. They have to travel farther and farther to find the right wood for charcoal or available firewood.

Haiti is one of the many countries that relies on unclean fuels making a simple activity like cooking time-consuming and dangerous -- a growing issue specifically burdening women. As the Haitian forests continue to be depleted, women and girls must travel increasingly greater distances to find adequate supplies. These voyages often take several days with women carrying loads of wood strapped to their backs or balanced on their heads. The danger is not only in the distance traveled but also in the competition for this scarce resource. The practice leads to foraging on others territory resulting in violence as horrific as sexual assault and rape.

One of the benefits of Haiti is in its sun-rich location, on average offering 7-9 hours of sunlight per day (Information, 2015). Solar power is readily available in Haiti and severely underutilized. This plan will address three primary areas deforestation, gender inequality and the use of dirty fuel as an alternative energy for cooking. Solar cooking is simple to use, safe, and a convenient way to cook food without the use of unclean fuels. Our goal is to open a facility run by women that will assemble solar cookers to be sold in Haiti. Providing an alternative cooking option for such a fuel-scarce region, will empower women to hold jobs, contribute to their households, reduce the cost of food, and reduce their exposure to violence. It is our hope to reveal that this method of cooking will also contribute in some degree to the preservation of local environments.

THE OPPORTUNITY

Solar cookers will not solve the gender inequality or deforestation issues, but they present an opportunity to help diminish the problem. The key elements of Sun Top's business model are local production and community-based sales. Producing solar cookers locally and relying on a Haitian sales force will create jobs for women and keep production and labor costs low. Local manufacturing will also promote a sense of community involvement in the project.

This plan proposes that solar cooking can affect communities positively and over time create lasting benefits. Specifically, deforestation has impacted the populace's ability to find once readily available cooking fuel sources. Because cooking is largely the responsibility of women, this shrinking fuel source further contributes to the inequality faced by females. Women must spend money on fuel, or they are forced to take perilous trips to find wood. A woman-owned facility that assembles and sells solar cookers has the potential to empower women in substantial ways. Women will feel like valuable contributors to their homes by being gainfully employed (more so than husband farmers). Employment will produce a powerful increase in their self-worth, permitting women the strength to decide their own futures rather than have poverty dictate it.

Solar cookers are a modest solution to highly complicated social and economic issues. With small incremental steps, change is possible. Policymakers are looking to the energy industry to foster change in Haiti, with hope for future prosperity. The rising star in this sector is sunlight - an underutilized, clean energy source, readily available to all. The solar power industry is an increasingly attractive investment opportunity. Primed for

growth, solar energy can drive momentous change critical to the social and economic welfare of a nation. With a motivated, eager and low-cost workforce, production, sales and use of solar cookers will greatly impact the quality of life in Haiti.

BUSINESS MODEL

Sun Top, a not-for-profit social venture organization, will import solar cooker parts for assembly in a small woman-operated manufacturing facility. The end product will be sold to villagers. Sustainable work-to-own programs will provide employees with free solar cookers as a benefit of their employment. It is important that those working for the organization are users of the product. Sun Top will also offer educational programs emphasizing the value of alternative fuel cooking methods.

The following funding sources will be pursued to augment cost associated with operations:

- Grants
- Donations
- Angel Investors
- Strategic Partnerships (more details under collaborations)

Additionally, we will collaborate with local micro-lenders in Haiti to help fund those who wish to purchase a cooker (more details below).

OPERATIONS

Solar cookers will be sold to households in Merceron, Tri Marche, and Bas Boën villages. The stove parts will be manufactured by a US supplier and imported, where they will be assembled by the local production facility employing villagers. Final product will be marketed by villagers to other villagers. We will employ a sales team, education/marketing teams and manufacturing/assembling staff. The extensive scope of this project will require implementation in several phases as explained below.

Phase One Education:

- Because charcoal and wood are widely used, conversion to solar energy and learning how to cook with it will take substantial education.

Phase Two Training:

- Training of staff on the product attributes and sales strategies.
- Establishment of village territories.
- Training on product assembly as well as quality control.

- Locations will be scouted for suitable manufacturing facilities. Discussions with the manufacturing supplier will be held relative to reducing initial construction costs, thus easing the initial investment burden.

Phase Three Manufacturing:

- Construction of manufacturing facilities in Haiti.
- Manufacture and sell solar cookers.

Phase Four Distribution:

- Training sales team on 'sales pitch.'
- Begin door to door selling and delivery of purchased products.

PRODUCT STRATEGY

Implementation of a robust plan to raise awareness, train and produce of solar cookers. Three production options were analyzed: (1) production completely in Haiti (2) produced completely in the USA or (3) produce parts in the US and import those parts to Haiti for assembly. Much more research needs to be completed, however preliminary research reveals that production of parts in the US and importing those parts to Haiti for assembly is the most feasible manufacturing process. To determine which option makes the most sense a review of the pros and cons of each option was considered (see table 1).

Table 1: USA or Haiti Production Pro's & Con's

	Produced In USA	Produced in Haiti	Produce Parts in USA Assemble in Haiti
Pros	- Established supply chain - Quality Product - Lower material cost - Access to multiple suppliers decreasing material cost	- Lower labor cost - No import cost - Collaboration with other local businesses	- Established supply chain - Lower material cost - High quality product - Access to multiple suppliers decreasing material cost - Supplier has high-quality control standards
Cons	- Higher labor cost - High import tariffs - Risk of shipping delays - Working capital tied up in long lead-time and buffer inventory	- Higher start-up cost - High material cost - Government corruption - Construction of facilities - Limited consistent resources availability - Many regulations	- Deferred cost for facilities - High labor manufacturing cost (USA & Haiti) - Government corruption

Partnerships are being developed with Solavore, a socially conscience company currently producing solar cookers in the US. This partnership is important for many reasons. Solavore currently holds the intellectual property for the solar cookers as well as a manufacturing facility. Solavore as a strategic partner, removes the burden of investment in research and development from our organization.

Startup organizations are typically low on available capital. Expanding operating capital for research and development (R&D) could hinder the successful start of the business, and in some cases, the business never gets off the ground. Since Solavore has a developed product, funding for R&D

will not be necessary. Another advantage of partnering with Solavore is enabling that company to expand their international networks, something the company has been working toward, but currently does not have the capacity to do. Sun Top is capable of laying the ground work (finding in-country partners, employees, locations and funding), thereby benefitting both entities. Complementary strengths of each organization combine to motivate, support and expand the reach of both companies. Solavore's product has been tested and has a reputable supply chain. Working with an established company also minimizes our material cost. Solavore will seed the first 50 to 100 solar cookers decreasing the procurement cost of our initial inventory. They have also illustrated best practices for working in underdeveloped countries and are willing to share those best practices on with us. From a marketing perspective, we are expanding Solavores brand awareness exposing them to potential customers they otherwise would not have reached. Sponsorship of the brick & mortar assembly facilities in Haiti are in negotiation with Solavore.

IMPLEMENTATION

This project will be implemented in cooperation with three organizations: a farmer's association, Haitian Foundation for Sustainable Agricultural Development (FONHDAD), and a solar cooker company located in the US

and Clark University. FONHDAD will function as our in-country partner to provide support and aid us with the Haitian community, facilitating connections with potential employees and customers. FONHDAD will also be the host location for events. Our solar cooker partner, Solavore will be the supplier of solar cooker parts that will be shipped to Haiti for assembly. Clark University will be the conduit for student interns as well as a field site for students in Haiti. Additional details for each of our partners are found under collaborators.

MARKETING/ SALES

To see the true business potential in Haiti one needs to look beyond the surface. With a stagnant growth rate of 1 percent on average, Haiti's economic progress appears less than hopeful. There are 1,094,591 women ages 15-24 and 1,815,819 women ages 25-54 in Haiti and the female unemployment rate is at 8 percent (Factbook, 2015). Port-au-Prince's, the capital city, is the economic hub of Haiti, composed of densely populated shanty towns making population difficult to accurately assess. Port-au-Prince estimated population is 2.44 million (Factbook, 2015). Despite the numbers, Haitians are looking for work and willing to learn the skills necessary to get a job.

MARKET SIZE

According to the United Nations information there are approximately 2,000 plus inhabitants in Merceon (Affairs, 2015). Unfortunately, accurate population for Tri Marche, and Bas Boën villages could not be determined. Therefore, assumptions have been made of similar population in Tri Marche, and Bas Boën for a combined assumption of 6000 inhabitants. Many families live together or multiple generations occupy one home, the assumption is of the 6000 inhabitants only half are actual households. We will be focused on three villages in which to market our products.

Table 2: Potential Village Market Penetration

	Low	Base	High
Number of Households	3000	3000	3000
Expected market penetration	5%	8%	10%
Total Stoves sold	150	240	300

TARGET MARKET

Our target market is women in rural villages in Haiti (the pilot will be specifically in Merceron, Tri Marche, and Bas Boën). These specific villages have been chosen for two reasons. First, they are places in which FONHDAD currently has a presence to help the communities develop farming techniques. Therefore, relationships between FONHDAD and these

communities have already been established. Secondly, the women farmers that I met with during my visit to Haiti were women from these villages. Talking and working with these women farmers helped develop trust between myself and the women. The women farmers specifically asked the group to help them figure out ways they can feel more accomplished and empowered. Our dialogues began a relationship, developing sufficient trust to pursue our venture. Gathering cooking fuel prevents women from working, focusing on their children or getting an education. The women who embrace our solar cookers have the incredible opportunity to eliminate time used to collect fuel, precious time that can be used to make one meal for their families. Despite the fact that they may not be the main household purchasers, women are the cooks, therefore, will influence the purchase decisions.

Agriculture in Haiti has become much more challenging over the years due to eroded soil as a result of high rates of deforestation. Farmers may not be primary purchasers of solar cookers; however, they are concerned with improving the environment. Hence, farmers are an important component of the secondary target demographic because of the positive impact to their industry by decreasing the rate of deforestation. Our secondary target market will also be beneficiaries of the product. We believe this will make

them quickly become advocates for our product. During my trip to Haiti, we had the opportunity to speak to many farmers at Agriculture Day at the FONHDAD compound. We repeatedly heard concern for rates of deforestation, inability to grow or yield a viable harvest due to the unnourished soil; this was a major concern. At this same event, participants showed a marked interest when the solar cooker was demonstrated.

Let's assume that customers are purchase one large bag of charcoal at a cost of $30 per week (on average lasting one week), we can make the assumption that by utilizing an alternative cooker source will save our customers half of their cooking fuel cost. This calculation implies the solar stove is used 50 percent of the time to prepare meals.

Product Showcase Events we plan to have will demonstrate to customers how to operate the cookers. Stoves will be available for sale at these gatherings as well as sold directly to the customers by village ambassadors. Details on how this process works can be found in the promotion and communication section.

The obstacles to implementing manufacturing operations in Haiti are sizeable, including the disaster-prone environment, and could cause delays

in the process. Other potential obstacles to launching a startup in Haiti are logistical, such as infrastructure issues to access roads, clearing land of brush, constructing or renovating buildings, purchasing a generator or setting up an electrical system, drilling a well or developing near a sufficient water supply. Another hurdle we might face is introducing the "new technology" and convincing people to buy. Inevitably, there will be early adopters who, without the need for much convincing, recognize the usefulness of a new product and use it immediately. Due to the long history of utilizing charcoal and wood for cooking, Haitians don't yet understand the value of our product in their lives. This will challenge us to develop a strong strategy for penetrating our target market.

PROMOTION & COMMUNICATION STRATEGY

While there are areas in Haiti exposed to solar power, the majority of the country is still in the dark as to its usefulness. Changing consumer behavior will be the first barrier to overcome. Table 3 below reveals the cookers usefulness and benefits.

Table 3: ***Health, Environmental & Cost Benefits of Solar Cookers***

Health Benefits	Environmental Benefits	Cost Benefits
Clean method of cooking contributes to better air quality indoors – smokeless	Reduced emissions	Aside from initial purchase cost, free cooking cost

No danger of fire - safe	No energy source needed other than sun	Reduces the amount of duty fuel needed to cook
Reduce physical strain of carrying wood	Leaves forest in tact	Reduces amount of money spent on fuel
	Ability to cook during natural disasters	

Education/Awareness

Billboards will be posted to create awareness, ignite interest, and communicate the benefits of the product. Bi-monthly community cooking demonstrations will be hosted through FOHNDAD. These will focus on educating villagers, increasing awareness, and building interest. These community events will be run by Village Ambassadors, who will use solar stoves to cook different tasting recipes. FONHDAD will be the host location for many of these events, as well as other sites. The intent of these educational activities is to satisfy their curiosity, remove apprehension, and developing an understanding of the practicality of the stove. Events will also facilitate introductions of Village Ambassadors to the community.

Product Showcases

Showcases will take place in various villages to demonstrate and sell the solar stoves. Multiple stations will demonstrate how to cook traditional foods. Servers will be move through the crowd to offer samples. While demonstrating cooking or technical use, hosts will also communicate the

benefits of the stoves (environmental, health and decrease in household cost) as well as the potential business opportunity of selling the cookers.

Village Ambassadors

Village Ambassadors are local women who will teach others how to use and sell the cookers. Employing locals will increase our credibility and their comfort level with Sun Trust, enabling expanded outreach to villagers and communities that did not have the opportunity to attend a demonstration.

Considering the lack of internet access, the best means of marketing would be through the use of billboards, word of mouth and local demonstrations. Potential customers need to see the cooker in use to grasp its tremendous benefits.

Although the solar cookers are neither familiar nor similar to their existing cooking methods, we do not anticipate difficulty with customers' acceptance of this product. Our close community relationships and local production will illustrate our dedication improving Haitian citizens' quality of life. We recognize everyone will not be able to afford the stove. Our innovative partnership with a microfinance institution will generates opportunity for customers to purchase the stove despite their current

financial situations. Affordable payments will make the stoves more widely accessible. Our goal is a solar cooker in every home.

COMPETITOR ANALYSIS

Potential competition to Sun Top's business model is almost nonexistent. Indirect philanthropic organizations as well as Carbon Roots International are not a threat to fulfilling our mission. There are no direct competitors in the local market. No other company produces solar cookers in Haiti. None of the competition is doing work in Haiti year round nor in the villages we will serve. A profile of the competition follows.

COMPETITIVE COMPARISON

Sun Oven: US manufactured product, sold to outdoor enthusiasts and the environmentally conscious. They sell two primary types of stoves to individuals for $349 - $399 retail. Sun Oven gives back, through partnership with many organizations that donate Sun Oven products to multiple impoverished countries. The have been working in Haiti for more than 18 years. Sun Oven's primary contribution to Haiti has been their Global Sun Ovens, which are large solar cookers provided to organizations (not individuals) to provide meals for schools and children's programs. To date, they have provided 400 ovens to Haitian schools.

Clean Currents Located in the US, Clean Currents primary business is selling wind power to Eastern states. They provide philanthropically to different third world countries on a seasonal basis. They partner with Solar Cookers International and have distributed 150 – 200 household solar cookers in Haiti. However, their primary focus is in Africa and Nepal. Through a partnership with the Friends of Haiti Organization, they have helped to distribute 5,607 solar cookers in Flamand, Haiti, and 1,657 in Port-au-Prince. Friends of Haiti's focus is not solar cookers – they take a holistic approach to the improvement of Haitians' lives.

Global Ministries: A part of the United Methodist Church, they have been shipping solar ovens for distribution to the Southern Peninsula of Haiti. In 13 years they have distributed 8500 cookers. The ovens are manufactured, assembled, packed and shipped by volunteers at an annual Dakota Conference. The cost is $125 to produce and ship. The cost of labor and shipping is donated. Once the cookers are in Haiti people must commit to a 2-day seminar and pay $25 for a solar cooker. The solar cooker project in Haiti is one of many projects and countries in which the Methodist Church is involved, therefore the solar cooker project is not their primary focus.

Carbon Roots International: Located in La Coupe (Nord-Est of Haiti), the company makes and sells green charcoal that is produced and sold in Haiti by locals. Maintaining the Haitian tradition of cooking with charcoal is the company's focus. Although anyone can purchase the product, their primary target market is farmers. Green charcoal helps provide nutrients to the ground and allows the soil to yield more crops. Although Carbon Roots produces a different product, they will be our biggest competition because they are producing a product similar to ones already being used. Maintaining the culture is a smart business strategy. Nevertheless, I believe we can be competitive with the solar cooker as there is no additional cost to use our product. Therefore once the purchase is made money can be spent on other needs rather than fuel. There is also an opportunity to partner by seeing our products as complementary rather than competitive. Using a solar cooker can decrease total cooking cost; however, if the desire is to use charcoal for particular dishes or when it's raining, green coal is the better option for health and the environment than traditional charcoal.

With the exception of Carbon Roots, our competitors' target market is the US, or those who are able to pay full price for their product. They also

donate the product to communities. Their international work is in multiple countries and a small part of their corporate social responsibility.

Our organization is different in that we are not just donating solar cookers to the community. We believe our solar cookers can have a positive impact on the lives and environment of those who use them. Our goal is to create economic growth for women. Our competitive advantage is that we are empowering and training women to produce and sell solar cookers, creating sustainable employment. We are focused on bringing a product to Haiti to help its people and change the dynamic of their country's environment. Therefore, we plan to tackle our competition by first developing strong community relationships. We will host village events to raise awareness about the benefits of our stove while encouraging community interaction to facilitate a unique experience using the cooker themselves. Our Village Ambassadors will address any concerns with the product and, make recommendations for incorporation of future designs.

Some of the barriers to entry into Haiti would be lack of infrastructure including building, roads, and sustainable electricity. Also, the under-educated workforce may impede development of an immediate high-functioning staff. Time and resources will need to be dedicated to training

employees on the product itself as well as how to sell, assemble and other skills required for staff positions.

ORGANIZATION

The development of Sun Top is an enormous undertaking and as mentioned will be implemented in phases. Recognizing that additional in-country research is needed to establish relationships, implement our educational programs as well as secure a location, the initial executive team will consist of Dr. Jeffery Williams (my husband) and myself. Strategic partnerships will be developed to assist in moving the business forward. Sun Top's primary focus is to empower and employ women. We will aggressively recruit unemployed women for all staff positions within the organization. However, we will not discourage men from applying for jobs. We will be hiring for assembly workers, Village Ambassadors, and management positions. Once we have progressed to the point of hiring, our plan is to collaborate with Clark University students interested in field work, acting as interns with the organization to supplement training efforts (see Exhibit 2 for details).

TEAM BIO'S & QUALIFICATIONS

Lelani S. Williams, a 3rd year dual degree Master of Business Administration (MBA)/Community Development & Planning (CDP) student at Clark University in Worcester, MA, with a concentration in Social Change. Her interest in CDP and social change developed when she had the opportunity to go abroad for several missions trips to Haiti, the Dominican Republic, Kenya, Zimbabwe and Zambia providing medical relief, business development education and spiritual restoration consistent with her Christian faith. She learned about the inequalities affecting indigenous communities, experienced different cultures, and became inspired by these international experiences. Williams' educational experience relevant to this business included classes in:

- Negotiations: Community Development
- Community Needs & Resource Analysis
- Non-Profit Management
- Strategies: Community Organizing
- Social Entrepreneurship
- Corporate Social Responsibility
- Grant writing
- Operations Management

All of these classes contributed to development of the skills necessary to be a great CEO and filled her entrepreneurship toolbox.

Prior to deciding to continue her education, Lelani was the Director of Training at the Rhode Island Small Business Development Center (RISBDC) for 7-years. The position included responsibility for providing small businesses with the tools and resources to be successful through a variety of educational programming and events. Her leadership, project management, and team-building skills were recognized for her work developing an SBA Best Practice for Managing Conferences citation. Through her management of the America's East Conference for SBA Lenders held in Newport, RI, Williams' was awarded the "2008 State Star" at the National Conference for the Association of Small Business Development Centers (ASBDC). Before joining the RISBDC, Lelani spent three years at Leadership Rhode Island where she was responsible for coordinating leadership events and facilitating training activities to provoke RI leaders to make a difference in the state. Her most significant accomplishment with LRI was leading a task force in developing criteria for ensuring issues of equity and justice were reflected in leadership training.

Williams' creativity, business acumen, and entrepreneurial spirit are embodied in LBDesign, a graphic design business she started in 2003 to provide affordable design and marketing solutions to the underserved minority business community. Lelani has been able to establish a consistent base of New England clients, providing a range of solutions such as brochures, flyers, logos, business cards, multimedia presentations and website design development.

Lelani contributes to her community in many ways: serving as a member of the Board of Directors at the Cathedral of Life Christian Assembly, RI Free Clinic and the United Way's Community Advisory Board and Woman's Leadership Council. Lelani also holds an Associate Degree in Criminal Justice from Johnson & Wales University (1997), Bachelors of Science Degree in Business Marketing from Bryant University (2007) and is a certified behavioral consultant. Williams' is a recipient of the 2010 "40 Under Forty" award by Providence Business News and was more recently recognized as the "2012 Community Champion" by Women In Charge.

Dr. Jeffery Williams

The Right Reverend Doctor Jeffery A. Williams, a native of Englewood New Jersey. In 1981, Williams attended Brown University (Providence, RI) and

graduated with a Bachelors of Arts degree in Social Environmental Analysis, a concentration he personally created. In May 2007, Williams received his Doctorate of Ministry Degree in Urban Complex Settings from Gordon-Conwell Theological Seminary (Hamilton, MA). His completed dissertation entitled: "Urban Leadership Development Through the Practical Truth University: A Case Study in the Intentional Role and Practice of 'Metanoia' for Personal and Community Transformation" is a manual for much of the work he does today. Dr. Williams graduated in June 2010, with a Master's in Public Administration from the Harvard Kennedy School of Government. Dr. Williams was Appointed Bishop Ordinary with responsibilities in ten countries, including Haiti, and oversight of 50 Parishes. He is married to Lelani (Bonner) Williams. Dr. Williams is the enthusiastic father of two college-age daughters, Joy Victoria and Grace Noelle Williams.

His commitment to helping others understand the connection between principle and practice led to the founding of the Cathedral of Life Christian Assembly in 1999, which now called "The King's Cathedral." Under Dr. Williams' leadership, the Cathedral now owns five properties, including an historic church located in the Olneyville Square neighborhood of Providence and has distributed over 110 tons of food and tens of thousands of articles of clothing, household goods and furniture to those in need. He

also hosts leadership and business development seminars for the Greater Providence community. As Chief Empowerment Officer, his congregation in Providence has grown from nine members to well over five hundred (500), with 30 different ministries and programs. Dr. William's is the author of Kingdom Success Webinars and a daily radio Program on WSTL Radio (1220 AM). Internationally, Dr. Williams has established the "The Well-Life Project" which is the funding arm to create 12 freshwater wells in Kitwe, Zambia. Dr. Williams has been an annual chapel speaker for the New England Patriots as well as other professional football and soccer teams from 2005 to 2014.

COLLABORATORS

Beginning a business in another country can have its challenges. Therefore, it will be important to have an in-country partner who knows the regulations and internal network of the country to accomplish our goals efficiently and effectively. Our in-country partner will also be the key to research needed for the first stage of development, which is educating communities about the benefits of solar cooking. As critical relationships are built, additional strategic partners will be brought on as appropriate.

Our in-country partner, FONHDAD, is a nonprofit organization with US funding, aimed at modernizing Haitian agriculture using contemporary

practices. FONHDAD has already begun to empower women in the farming industry. However, they are discovering women participating in the program desire empowerment in other sectors. FONHDAD will act as the conduit to introduce the solar cookers to the Haitian community. Already embedded in the community. FONHDAD is a trusted organization and will be quickly received. FONHDAD will also facilitate connections to the government and other potential grant opportunities. FONHDAD has experienced the process of launching an organization; their best practices can assist us in navigating governmental departments and regulations. What also makes FONHDAD unique is they also have the potential to be a client; they may consider purchasing solar cookers for donation to the community as part of the educational phase of implementation.

FONHDAD, Haitian Foundation for Sustainable Agricultural Development, is a non-profit institution with administrative and financial autonomy. Its aim is to contribute to the modernization of Haitian agriculture by introducing new techniques, fertilizers and improved equipment, enabling the agricultural sector to achieve better yields, and moving toward commercializing its products.

Our primary contact will be Kénel Cadet, Executive Director of the Rural Sustainable Development Centre (CRDD) of Bas Boën. CRDD is a research center, a demonstration center, a training center and a popularization center. Kénel Cadet has a vested interest in working with **Sun Top** because of his organization's efforts on behalf of women farmers. CRDD supports women farmers who wish to break into a new industries and develop skills beyond farming. Kénel will be our advocate in building relationships with Haitian communities.

Clark University will be another important collaborator with Sun Top. Our business will be an excellent path to providing hands-on experience to students pursuing international business and development. Once established, Sun Top will offer opportunities for internships as well as act as a site for the Clark Field School.

Jude Fernando, Ph.D., Associate Professor of International Development and Social Change Department of International Development, Community, and Environment, Clark University, Worcester, MA. Jude has been a mentor on this project and would continue to be an advisor and our liaison to Clark University students.

Jude Fernando is authoring a book, Political Economy of NGOs: Modernizing Post-modernity, which examines the controversial social roles of micro-credit NGOs in India, Sri Lanka and Bangladesh and their links to the state, based on his long-term fieldwork in the 1990s. He was principal investigator for the project, "Sustainable Development and Civic Society," funded by the Office of Sustainable Development and Intergovernmental Affairs of the U.S. Department of Commerce, and in 2002, he organized the international conference, "Sustainable Development in Urban Communities." He has consulted for the Asia Foundation, IFAD and the World Bank. In Sri Lanka he worked in conflict zones for World Vision. Fernando previously taught at the Department of Geography and Regional Development and the International College at the University of Arizona; Dordt College, Iowa; and was a visiting lecturer at the University of Colombo in Sri Lanka.

Last year, Fernando and his colleagues in Sri Lanka established the Alfa Children and Youth Training Institute in Sri Lanka (ACUIS), a non-governmental organization (NGO) to assist children and youth affected by the Southeast Asian Tsunami of 2004. ACUIS resulted from the lessons Fernando learned while working with tsunami victims and conducting participant observer research on humanitarian assistance provided by

existing NGOs in the region. He found many of these organizations rarely invest much time and resources for creating a viable learning environment conducive for long-term, formal education, and vocational training facilities that would lead to sustainable employment and resettlement for the displaced children and youth. Fernando felt that a fundamental pre-requisite for improving the quality of life is a viable learning environment that would complement the services provided by the public school system. By using an experimental child-centered rights-based approach model to social change, Fernando hopes to combine academic research with practical projects aimed toward positive social change.

Solavore, a socially-conscious company, is currently producing solar cookers with a mission of "providing healthy cooking-fuel alternatives to the world (Solavore, 2015)." Our missions are perfectly aligned! This partnership is important because Solavore currently holds the intellectual property for the solar cookers as well as a manufacturing facility. Engaging Solavore as a strategic partner prevents the need to invest in research and development. Their product has been tested and proven to work will in different environments. Working with an established company also cuts down on our material cost as they are already making purchases in bulk purchases.

FINANCIALS

Funding of $5,000 is needed for phase one. This startup capital will be used to perform market research and plan education and training. The funding will be used on plane tickets to Haiti, accommodations while doing additional field research, investigating facility location, planning and preparation for phase two, as well as producing of marketing materials. We understand it will take some time to get up and running and do not anticipate making any actual sales for the first four months. Nevertheless, we will be applying for grants and raising money immediately. We have projected income from grants, donations (Go Fund Me and Kickstarter), as well as investors (Friends and Family). According to our financial projections, although we have some profit within Q3 of year 1 we are not constantly profitable until year two. We will aggressively work to acquire some raw materials directly in Haiti to reduce material and shipping cost. We will also consistently review how our decreased cost can decrease the pricing of the cooker. A detailed explanation of our financial projections may be found in Exhibits 4 & 5 attachments. The microfinance option is reflected as revenue as an upfront cash payment. We are assuming 10 percent of our monthly sales will require a loan.

PRICING STRUCTURE

The price of the Sun Top cooker is $120. To many that cost will seem high for a developing country, however our solar cooker is made out of recycled plastic. The quality of the cooker ensures a longer functionality than other cookers. The initial cost to the customer is a barrier to selling our solar cooker. We plan to overcome this obstacle by partnering with a local microfinance lender. A finance option allows the customers to pay back the cost of the cooker over time rather than all at once. There will also be work-to-own options, allowing employees to work off the cost of their cooker. We estimate it will take 3 – 3 ½ months.

SUSTAINABILITY

As a social venture, it can be challenging to measure success as easily as a for-profit business where profitability is the clear standard to indicates success. We will focus on blended returns to determine our success. Profit will be an important by-product of production of the solar cookers; however, we will also need to utilize measures that are more difficult to quantify - the impact on community and culture as a whole. The "triple bottom line" – people, planet, and profit will be out measurements:

- People: the number of women trained in producing solar cookers, households who own the product
- Planet: within the focused villages examine decreases of dirty fuel usage and money spent to purchase it.
- Profit: from sales, part-time and full-time jobs created

Also, to assist with monitoring and data collection, surveys will be conducted to measure the number of households using wood or charcoal for fuel to establish a baseline before introducing the solar cookers to the community. Village ambassadors will make subsequent visits to households, documenting the number of households consistently using the solar cooker and the frequency of use. Comparisons will allow an accurate assessment of the project's long-term success.

APPENDIX

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EXHIBIT 1: OPERATIONAL VALUE CHAIN

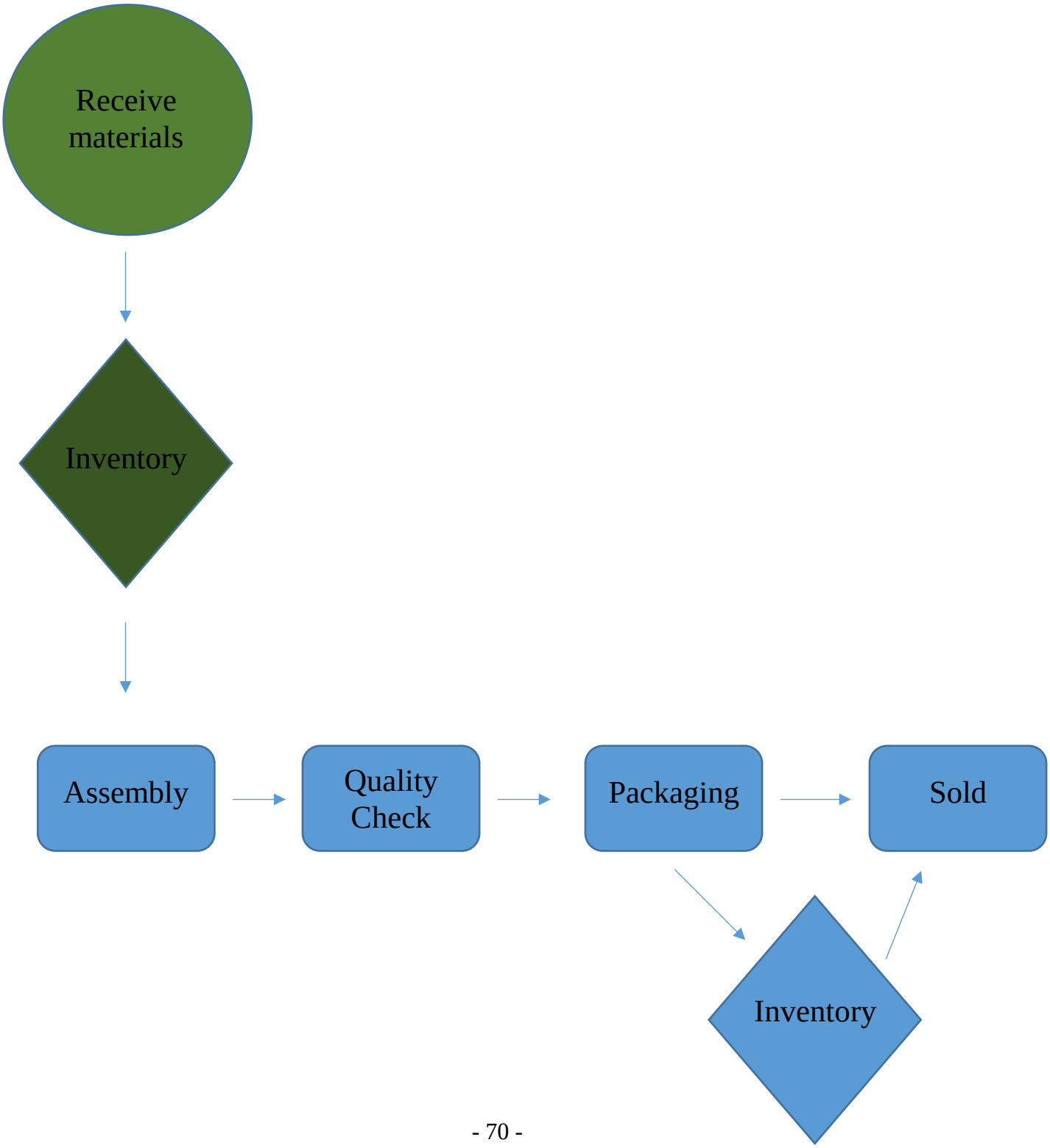
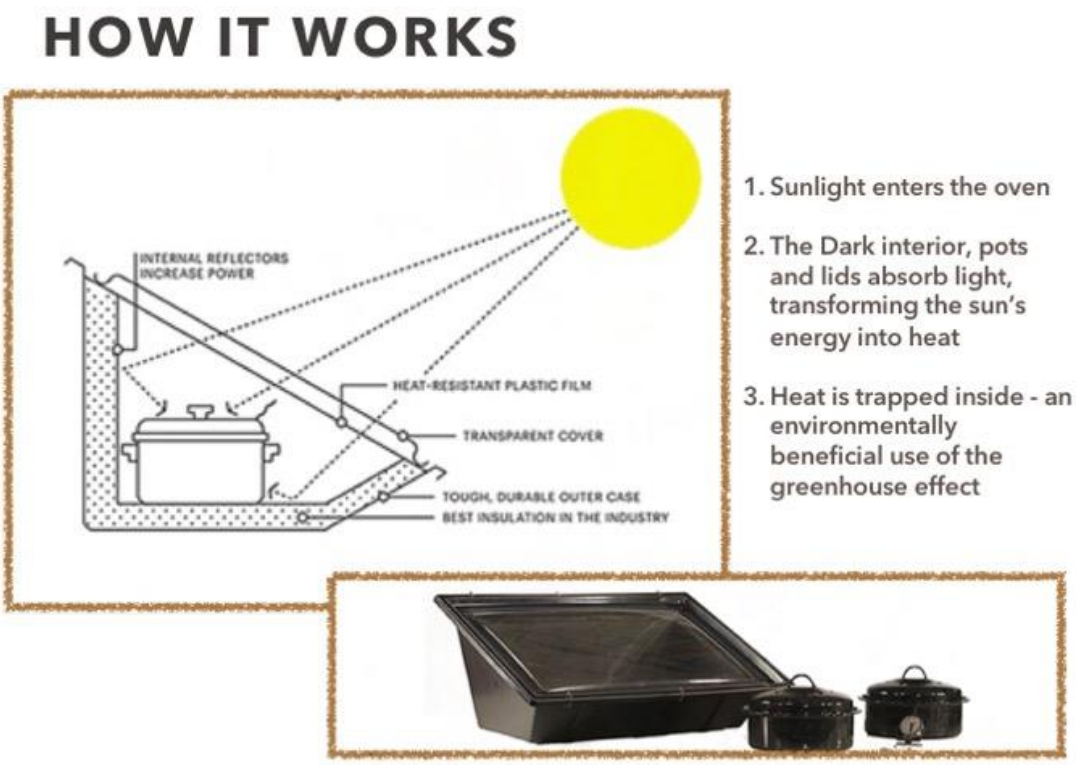


EXHIBIT 2: PERSONNEL CHART

Position	Number Employed	Responsibilities	Salary
Manager	1	Inventory & Shipping Administration Quality Control	$160/month
Village Ambassadors	5	Sales Education Customer Service	$120/month
Assembly Workers	3	Produce X cookers/day	$96/month

EXHIBIT 3: SOLAR COOKER DIAGRAM



* Solavore, LLC, 2015. http://www.solavore.com/mission/

EXHIBIT 4: MATERIAL COST

Solavore Sport Material Costs

(SOLAVORE COMPANY - CONFIDENTIAL - USED WITH PERMISSION - DO NOT SHARE

Developing Country Price (Solavore Sport Solar Oven + Reflector)	**$**	**120.00**	
Component breakdown	**Local-Sourced**		**Solavore-Sourced**
Solavore Sport Solar Oven			
Housing			Injection molded; high $ CapEx
Collar			
Insulation	$	6.42	
Aluminum Liner	$	3.35	
Lid			Vacuum molded; high $ CapEx
Clip/Screws			Misc hardware makes sense for
Rachet Fasteners			Solavore to buy in volume
Accessories	$	14.92	2 (3qtr) pot and thermomitor & water pasturization Indicator
Water Pasturization	$	3.00	
Accessory Packaging	$	1.37	carboard box to support during shipping
Piece Work Labor	$	15.00	Kits: precutting of instillation and liner
	$	41.06	
Solavore Sport Reflector:			
Aluminum Parts	$	17.00	
Springs & Links	$	1.88	
Black Tabs	$	0.22	
Piece Work Labor	$	2.25	
Literature	$	0.07	
	$	21.42	
Subtotal w/o Pkg:	**$**	**62.48**	
Packaging	$	8.00	
Total, Packaging Included	**$**	**70.48**	
Shipping/Customs	$	1,500.00	* shipping 2000 in 40 foot container

EXHIBIT 5: YEAR ONE PROJECTIONS

Projections

Revenues[1]	May	June	July	August	September	October	November	December	January	February	March	April	Total 12mths
Ureka Grant	5,000												5,000
Investors				800	800	800	800	800	800	800	800	800	7,200
Donations				500	500	500	500	500	500	500	500	500	4,500
Micro-Finance	0	0	0	0	120	120	180	180	180	240	240	300	1,560
Total Revenues	5,000	0	0	1,300	1,420	1,420	1,480	1,480	1,480	1,540	1,540	1,600	18,260
Sales[2]													
Units Sold	0	0	0		10	10	15	15	15	20	20	25	130
Price per unit	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Total Sales	0	0	0	0	1,200	1,200	1,800	1,800	1,800	2,400	2,400	3,000	15,600
Total Income	5,000	0	0	1,300	2,620	2,620	3,280	3,280	3,280	3,940	3,940	4,600	33,860
Cost of Sales													
Purchases													
Materials	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	846
Shipping Expnses (20' container -1000units)	0	0	0	0	0	1,500	0	0	0	0	0	0	1,500
	70	70	70	70	70	1,570	70	70	70	70	70	70	2,346
Total Cost of Sales	70	70	70	70	70	1,570	70	70	70	70	70	70	
	7048.00%	7048.00%	7048.00%	7048.00%	5.87%	130.87%	3.92%	3.92%	3.92%	2.94%	2.94%	2.35%	
Gross Profit before Labour	4,930	(70)	(70)	1,230	2,550	1,050	3,210	3,210	3,210	3,870	3,870	4,530	31,514
	98.59%	-7048.00%	-7048.00%	94.58%	97.31%	40.06%	97.85%	97.85%	97.85%	98.21%	98.21%	98.47%	
Labour Costs													
President	0	0	0	0	0	0	0	0	0	0	0	0	
Vice President	0	0	0	0	0	0	0	0	0	0	0	0	
Manager 1 ($5/hr/person)	0	0	0	0	160	160	160	160	160	160	160	160	
Villiage Ambassador 5 ($3.75/hr/person)	0	0	0	0	600	600	600	600	600	600	600	600	
Assembly 3 ($3.00/HR/person)	0	0	0	0	288	288	288	288	288	288	288	288	
Total Labour Cost	0	0	0	0	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	8,384
	0.00%	0.00%	0.00%	0.00%	87.33%	87.33%	58.22%	58.22%	58.22%	43.67%	43.67%	34.93%	
Gross Profit	4,930	(70)	(70)	1,230	1,502	2	2,162	2,162	2,162	2,822	2,822	3,482	23,130
	98.59%	-7048.00%	-7048.00%	94.58%	57.31%	0.06%	65.90%	65.90%	65.90%	71.61%	71.61%	75.69%	

EXHIBIT 5: YEAR ONE PROJECTION (CONT')

	May	June	July	August	September	October	November	December	January	February	March	April	
Gross Profit	**4,930**	**(70)**	**(70)**	**1,230**	**1,502**	**2**	**2,162**	**2,162**	**2,162**	**2,822**	**2,822**	**3,482**	23,130
Expenses													
Recruitment	200	200	200	0	0	0	0	0	0	0	0	0	600
Rent	150	150	150	150	220	220	220	220	220	220	220	220	2,360
Couriers	0	0	0	0	96	96	96	96	96	96	96	96	768
Insurances	0	0	0	0	0	0	0	0	0	0	0	0	0
Advertising/marketing	150	150	150	150	150	25	25	25	25	25	25	25	925
Staff Training	300	300	300	300	0	0	0	0	0	0	0	0	1,200
Postage	0	0	0	0	0	0	0	0	0	0	0	0	0
Printing & stationery	100	0	0	0	15	0	0	0	0	0	0	0	115
Cell phone	40	20	20	20	20	20	20	20	20	20	20	20	260
Computer Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor & Travel	50	50	50	50	50	0	20	20	5,500	20	20	20	5,850
Entertainment	0	0	0	0	0	0	0	0	0	0	0	0	0
Legal & Prof. Fees	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial services	0		0	250	250	250	250	250	250	50	250	250	2,050
Travel	1,300	0	0	0	0	0	0	0	0	0	0	0	1,300
Bad debt allow.	0	0	0	0	0	0	0	0	0	0	0	0	0
Canteen expenses	0	0	0	0	0	0	0	0	0	0	0	0	0
General expenses	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Lease Interest	0	0	0	0	0	0	0	0	0	0	0	0	0
Depreciation	0	0	0	0	0	0	0	0	0	0	0	0	0
Light & heat	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Expenses	2,490	1,070	1,070	1,120	1,001	811	831	831	6,311	631	831	831	17,828
	49.80%	107000.00%	107000.00%	86.15%	38.21%	30.95%	25.34%	25.34%	192.41%	16.02%	21.09%	18.07%	
Net Profit/Loss	2,440	(1,140)	(1,140)	110	501	(809)	1,331	1,331	(4,149)	2,191	1,991	2,651	**5,302**
	243952.00%	-114048.00%	-114048.00%	10952.00%	41.71%	-67.46%	73.92%	73.92%	-230.53%	91.27%	82.94%	88.35%	
Accumilated Net Profit/Loss	2,440	1,299	159	268	769	-41	1,290	2,620	-1,529	661	2,652	5,302	
Quarter Net Profit/Loss			**159**			**-199**			**-1,488**			**6,832**	

Revenues[1] :
Grants: Year 1 Ureka Grant, anticipated grants for year 2-3 from USAID & Clintin Foundaton
Investors: Family & Friends
Donations: Go Fund Me & Kickstarter campaigns

Micro-Finance: reflected as revenue as an upfront cash payment

Sales[2]: Solavore will seed the first 100 cookers therefore not cost reflected for first 100 sold. No cost for the first 100 solar cookers. are seeded)

EXHIBIT 5: YEAR TWO PROJECTION (CONT')

Revenues[1]	January	Febrary	March	April	May	June	July	August	September	October	November	December	Total 12mths
Grants													0
Investors	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	12,000
Donations	1,000	1,000	1,000	1,000	1,000	1,500	1,500	1,500	1,500	1,500	1,500	1,500	15,500
Micro-Finance	300	300	300	300	312	312	180	180	180	240	240	300	3,144
Total Revenues	2,300	2,300	2,300	2,300	2,312	2,812	2,680	2,680	2,680	2,740	2,740	2,800	30,644
Sales[2]													
Units Sold	25	25	25	25	26	26	15	15	15	20	20	25	262
Price per unit	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Total Sales	3,000	3,000	3,000	3,000	3,120	3,120	1,800	1,800	1,800	2,400	2,400	3,000	31,440
Total Income	5,300	5,300	5,300	5,300	5,432	5,932	4,480	4,480	4,480	5,140	5,140	5,800	62,084
Cost of Sales													
Purchases													
Materials	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	846
Production Expnses	0	0	0	0	0	0	0	0	0	0	0	0	0
	70	70	70	70	70	70	70	70	70	70	70	70	846
Total Cost of Sales	70	70	70	70	70	70	70	70	70	70	70	70	
	2.35%	2.35%	2.35%	2.35%	2.26%	2.26%	3.92%	3.92%	3.92%	2.94%	2.94%	2.35%	
Gross Profit before Labour	5,230	5,230	5,230	5,230	5,362	5,862	4,410	4,410	4,410	5,070	5,070	5,730	61,238
	98.67%	98.67%	98.67%	98.67%	98.70%	98.81%	98.43%	98.43%	98.43%	98.63%	98.63%	98.78%	
Labour Costs													
President	0	0	0	0	0	0	0	0	0	0	0	0	
Vice President	0	0	0	0	0	0	0	0	0	0	0	0	
Manager 1 ($5/hr/person)	160	160	160	160	160	160	160	160	160	160	160	160	
Villiage Ambassador 5 ($3.75/hr/person)	600	600	600	600	600	600	600	600	600	600	600	600	
Assembly 3 ($3.00/HR/person)	288	288	288	288	288	288	288	288	288	288	288	288	
Total Labour Cost	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	12,576
	34.93%	34.93%	34.93%	34.93%	33.59%	33.59%	58.22%	58.22%	58.22%	43.67%	43.67%	34.93%	
Gross Profit	4,182	4,182	4,182	4,182	4,314	4,814	3,362	3,362	3,362	4,022	4,022	4,682	48,662
	78.90%	78.90%	78.90%	78.90%	79.41%	81.14%	75.03%	75.03%	75.03%	78.24%	78.24%	80.72%	

EXHIBIT 5: YEAR TWO PROJECTION (CONT')

	May	June	July	August	September	October	November	December	January	February	March	April	
Gross Profit	**4,182**	**4,182**	**4,182**	**4,182**	**4,314**	**4,814**	**3,362**	**3,362**	**3,362**	**4,022**	**4,022**	**4,682**	48,662
Expenses													
Recruitment	200	200	200	0	0	0	0	0	0	0	0	0	600
Rent	150	150	150	150	220	220	220	220	220	220	220	220	2,360
Couriers	0	0	0	0	96	96	96	96	96	96	96	96	768
Insurances	0	0	0	0	0	0	0	0	0	0	0	0	0
Advertising/marketing	150	150	150	150	150	25	25	25	25	25	25	25	925
Staff Training	300	300	300	300	0	0	0	0	0	0	0	0	1,200
Postage	0	0	0	0	0	0	0	0	0	0	0	0	0
Printing & stationery	100	0	0	0	15	0	0	0	0	0	0	0	115
Cell phone	40	20	20	20	20	20	20	20	20	20	20	20	260
Computer Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor & Travel	50	50	50	50	50	50	20	20	20	20	20	20	420
Entertainment	0	0	0	0	0	0	0	0	0	0	0	0	0
Legal & Prof. Fees	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial services	0		0	250	250	250	250	250	250	50	250	250	2,050
Travel	1,300	0	0	0	0	0	0	0	0	0	0	0	1,300
Bad debt allow.	0	0	0	0	0	0	0	0	0	0	0	0	0
Canteen expenses	0	0	0	0	0	0	0	0	0	0	0	0	0
General expenses	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Lease Interest	0	0	0	0	0	0	0	0	0	0	0	0	0
Depreciation	0	0	0	0	0	0	0	0	0	0	0	0	0
Light & heat	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Expenses	2,490	1,070	1,070	1,120	1,001	861	831	831	831	631	831	831	12,398
	46.98%	20.19%	20.19%	21.13%	18.43%	14.51%	18.55%	18.55%	18.55%	12.28%	16.17%	14.33%	
Net Profit/Loss	1,692	3,112	3,112	3,062	3,313	3,953	2,531	2,531	2,531	3,391	3,191	3,851	**36,264**
	56.38%	103.72%	103.72%	102.05%	106.17%	126.68%	140.58%	140.58%	140.58%	141.27%	132.94%	128.35%	
Accumilated Net Profit/Loss	1,692	4,803	7,915	10,976	14,289	18,241	20,772	23,302	25,833	29,223	32,414	36,264	
Quarter Net Profit/Loss			**7,915**			**10,327**			**7,592**			**10,432**	

Revenues[1]:
Grants: Year 1 Ureka Grant, anticipated grants for year 2-3 from USAID & Clintin Foundaton
Investors: Family & Friends
Donations: Go Fund Me & Kickstarter campaigns
Micro-Finance: reflected as revenue as an upfront cash payment

Sales[2]: Solavore will seed the first 100 cookers therefore not cost reflected for first 100 sold. No cost for the first 100 solar cookers. are seeded)

EXHIBIT 5: YEAR THREE PROJECTION (CONT')

Revenues[1]	May	June	July	August	September	October	November	December	January	February	March	April	Total 12mths
Grant	5,000								5,000				10,000
Investors	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,500	12,500
Donations	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,500	1,500	13,000
Micro-Finance	180	180	180	240	240	240	240	240	240	240	240	240	2,700
Total Revenues	7,180	2,180	2,180	2,240	2,240	2,240	2,240	2,240	7,240	2,240	2,740	3,240	38,200
Sales[2]													
Units Sold	15	15	15	20	20	20	20	20	20	20	20	20	225
Price per unit	120	120	120	120	120	120	120	120	120	120	120	120	1,440
Total Sales	1,800	1,800	1,800	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	27,000
Total Income	8,980	3,980	3,980	4,640	4,640	4,640	4,640	4,640	9,640	4,640	5,140	5,640	65,200
Cost of Sales													
Purchases													
Materials	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	70.48	846
Production Expnses	0	0	0	0	0	0	0	0	0	1,500			1,500
	70	70	70	70	70	70	70	70	70	1,570	70	70	2,346
Total Cost of Sales	70	70	70	70	70	70	70	70	70	1,570	70	70	
	3.92%	3.92%	3.92%	2.94%	2.94%	2.94%	2.94%	2.94%	2.94%	65.44%	2.94%	2.94%	
Gross Profit before Labour	8,910	3,910	3,910	4,570	4,570	4,570	4,570	4,570	9,570	3,070	5,070	5,570	62,854
	99.22%	98.23%	98.23%	98.48%	98.48%	98.48%	98.48%	98.48%	99.27%	66.15%	98.63%	98.75%	
Labour Costs													
President	0	0	0	0	0	0	0	0	0	0	0	0	
Vice President	0	0	0	0	0	0	0	0	0	0	0	0	
Manager 1 ($5/hr/person)	160	160	160	160	160	160	160	160	160	160	160	160	
Villiage Ambassador 5 ($3.75/hr/person)	600	600	600	600	600	600	600	600	600	600	600	600	
Assembly 3 ($3.00/HR/person)	288	288	288	288	288	288	288	288	288	288	288	288	
Total Labour Cost	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	1,048	12,576
	58.22%	58.22%	58.22%	43.67%	43.67%	43.67%	43.67%	43.67%	43.67%	43.67%	43.67%	43.67%	
Gross Profit	7,862	2,862	2,862	3,522	3,522	3,522	3,522	3,522	8,522	2,022	4,022	4,522	50,278
	87.54%	71.90%	71.90%	75.89%	75.89%	75.89%	75.89%	75.89%	88.40%	43.57%	78.24%	80.17%	
	May	**June**	**July**	**August**	**September**	**October**	**November**	**December**	**January**	**February**	**March**	**April**	
Gross Profit	**7,862**	**2,862**	**2,862**	**3,522**	**3,522**	**3,522**	**3,522**	**3,522**	**8,522**	**2,022**	**4,022**	**4,522**	50,278
Expenses													
Recruitment	200	200	200	0	0	0	0	0	0	0	0	0	600
Rent	150	150	150	150	220	220	220	220	220	220	220	220	2,360
Couriers	0	0	0	0	96	96	96	96	96	96	96	96	768

EXHIBIT 5: YEAR THREE PROJECTION (CONT')

Insurances	0	0	0	0	0	0	0	0	0	0	0	0	0
Advertising/marketing	150	150	150	150	150	25	25	25	25	25	25	25	925
Staff Training	300	300	300	300	0	0	0	0	0	0	0	0	1,200
Postage	0	0	0	0	0	0	0	0	0	0	0	0	0
Printing & stationery	100	0	0	0	15	0	0	0	0	0	0	0	115
Cell phone	40	20	20	20	20	20	20	20	20	20	20	20	260
Computer Costs	0	0	0	0	0	0	0	0	0	0	0	0	0
Motor & Travel	50	50	50	50	50	50	20	20	20	20	20	20	420
Entertainment	0	0	0	0	0	0	0	0	0	0	0	0	0
Legal & Prof. Fees	0	0	0	0	0	0	0	0	0	0	0	0	0
Financial services	0		0	250	250	250	250	250	250	50	250	250	2,050
Travel	1,300	0	0	0	0	0	0	0	0	0	0	0	1,300
Bad debt allow.	0	0	0	0	0	0	0	0	0	0	0	0	0
Canteen expenses	0	0	0	0	0	0	0	0	0	0	0	0	0
General expenses	200	200	200	200	200	200	200	200	200	200	200	200	2,400
Lease Interest	0	0	0	0	0	0	0	0	0	0	0	0	0
Depreciation	0	0	0	0	0	0	0	0	0	0	0	0	0
Light & heat	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Expenses	2,490	1,070	1,070	1,120	1,001	861	831	831	831	631	831	831	12,398
	27.73%	26.88%	26.88%	24.14%	21.57%	18.56%	17.91%	17.91%	8.62%	13.60%	16.17%	14.73%	
Net Profit/Loss	5,372	1,792	1,792	2,402	2,521	2,661	2,691	2,691	7,691	1,391	3,191	3,691	**37,880**
	298.42%	99.53%	99.53%	100.06%	105.02%	110.86%	112.11%	112.11%	320.44%	57.94%	132.94%	153.77%	
Accumilated Net Profit/Loss	5,372	7,163	8,955	11,356	13,877	16,537	19,228	21,918	29,609	30,999	34,190	37,880	
Quarter Net Profit/Loss			**8,955**			**7,583**			**13,072**			**8,272**	

Revenues[1] :

Grants: Year 1 Ureka Grant, anticipated grants for year 2-3 from USAID & Clintin Foundaton
Investors: Family & Friends

Donations: Go Fund Me & Kickstarter campaigns

Micro-Finance: reflected as revenue as an upfront cash payment

Sales[2]: Solavore will seed the first 100 cookers therefore not cost reflected for first 100 sold. No cost for the first 100 solar cookers. are seeded)