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Miller Center
for Social Entrepreneurship

CREATING CLIMATE RESILIENCE THROUGH SOCIAL ENTREPRENEURSHIP

Photo credit: Carbon Roots International



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“Although climate change is an issue of global importance, the impacts will most severely be felt at [the] local level. Poor, natural resource-dependent households will bear a disproportionate burden of adverse impacts of climate change.”

From World Bank website, “[Local Institutions and Climate Change](#)” section



Photo credit: Komaza



Photo credit: Naandi Foundation

“Climate change is a global problem with grave implications: environmental, social, economic, political, and for the distribution of goods. It represents one of the principal challenges facing humanity in our day. Its worst impact will probably be felt by developing countries in coming decades. Many of the poor live in areas particularly affected by phenomena related to warming, and their means of subsistence are largely dependent on natural reserves and ecosystemic services such as agriculture, fishing, and forestry.”

Pope Francis, in his 2015 Encyclical on the Environment *Laudato Si*



CLIMATE CHANGE & CLIMATE RESILIENCE

As the average global temperature increases, the consequences of climate change are having the largest impact on the world's poor. This is the population least responsible for greenhouse gas emissions driving global warming — and least able to cope with effects such as droughts, flooding, deforestation and other habitat loss, diminished agricultural crops, lack of access to potable water, diminished energy sources, and the spread of tropical diseases.

The effects of climate change are already being felt in poor and developing regions of the world. In particular, **poor women are likely to be most vulnerable** to the effects of climate change: Their livelihoods rely more on natural resources threatened by climate change, and their ability to cope with the changes are hampered by social, economic, and political challenges.

One **promising response** to the effects of climate change is to empower these populations to develop *climate resilience*.

Climate resilience encompasses any activities that help vulnerable populations prepare more effectively for climate-related disasters and disruptions. Ideally, climate resilience translates into improved ability to adapt to and withstand the negative effects of climate change.

According to a presentation on **“Climate resilient pathways”** from the United Nations Intergovernmental Panel on Climate Change (IPCC) Working Group II—which focuses on the impacts of, adaptation to, and vulnerability to climate change—“Climate resilient pathways are development trajectories that combine mitigation and adaptation to realize the goal of sustainable development and help avoid ‘dangerous interference with the climate system.’”

To arrest and reverse the negative effects of climate change, it is imperative that governments of the world ratify an international treaty to reduce greenhouse gas emissions. Still, an international treaty alone is not enough to protect the planet or help those already suffering impacts of climate change. As an essential complementary strategy, we must create pathways toward climate resilience to help the poor and vulnerable withstand the impacts of climate disruption and continue to develop economically.

For instance, climate resilience can take shape as adopting new energy sources for lighting and cooking, or adjusting agricultural or livestock-raising systems, or finding alternative water supplies, or implementing different sanitation or health practices. In whatever form client resilience takes, successful actions require researching and developing effective solutions, as well as ensuring that the solutions fit the needs and the desires of the particular communities they are designed to serve. Otherwise, the solutions are less likely to be implemented.

Climate-resilience solutions are also well suited to addressing the needs of women, who are especially vulnerable to the effects of climate change. The majority of the world’s poor are women. In addition, women are limited in their coping capacity by social, economic, and political barriers, and because they typically carry the primary responsibility for securing water, food, and cooking fuel for their families.

At the same time, however, women’s extensive knowledge and expertise; responsibilities in their households and communities; and positions as stewards of resources mean that women also are key to successful climate resilience solutions.



Photo credit: Empower Generation

Promoting Climate Resilience Through Social Entrepreneurship: Miller Center's Role

Neither government policy, international aid, nor conventional economic development — as they have been practiced — are likely to foster climate resilience. These approaches tend to be:

- ➔ Broadly rather than narrowly focused, so less well-suited to the idiosyncratic issues of any particular community
- ➔ Generated through top-down, policy-driven processes
- ➔ Created and administered by people outside the communities being served
- ➔ Subject to financial overhead, bureaucratic inefficiency, and government-level corruption

Local institutions and organizations, driven or fueled by social entrepreneurship, are better positioned to enable climate resilience because each is embedded in a particular community and its social and economic structures.

Social entrepreneurship differs fundamentally from aid or charity because it applies business processes to solving social issues. Instead of being motivated by profits, social entrepreneurs measure their success by the degree of impact their enterprises can have upon social problems. Instead of serving the interests of governments, social enterprises are responsive to the needs of their local communities. They often provide self-sustaining economic models.

Social enterprises are frugal and nimble enough to provide essential goods and services to the poor — and to enlist the poor themselves in the sale, distribution, and after-sales

support of those goods and services. In so doing, they create livelihoods and long-term solutions for communities. When successful, social enterprises are able to jumpstart local markets that help entire communities, and especially women, strengthen their climate resilience.

[Miller Center for Social Entrepreneurship](#) at Santa Clara University is a leading organization for helping social enterprises around the world to scale their impact. Miller Center represents an intersection of Silicon Valley technology and entrepreneurship principles with its host university's Jesuit goals of enabling a more just, humane, and sustainable world. Miller Center accelerates social entrepreneurs through its three departments: the Global Social Benefit Institute (GSBI®), Impact Capital, and Education and Action Research.





Photo credit: Santa Clara University



GSBI®

GSBI has pioneered the process of developing capacity in social enterprises, making the goals of social entrepreneurship more practical and widely available to social enterprises worldwide. [GSBI programs](#) are aimed at helping social enterprises become investment-ready and able to scale for widespread impact. These programs — GSBI Boost, GSBI Online, and GSBI Accelerator — are tailored to specific stages of a social enterprise’s lifecycle.

Distinctive aspects of the GSBI approach include in-depth mentoring provided by seasoned Silicon Valley executives and connections with impact investors. As one example, the 10-month [GSBI Accelerator](#) program culminates in an Investor Showcase, where social entrepreneurs present to an audience of Silicon Valley investors and funders.

Since its founding in 2003, GSBI has worked with more than 500 social enterprises in more than 65 countries. Over time, the number of social enterprises addressing climate resilience has grown to well over half of each year’s cohort of GSBI program participants.



Impact Capital

[Impact Capital](#) works with the GSBI to prepare social entrepreneurs for investment. The Impact Capital team helps social entrepreneurs through financial coaching, educating impact investors, and developing innovative financial products that bridge the gap between micro-loans and conventional bank loans.



Global Social Benefit Fellowship

[Education and Action Research](#) advances Miller Center’s mission through learning, teaching, action research, and reflection. An undergraduate student fellowship program combines two quarters of academically rigorous research with a 6- to 8-week summer field research experience in the developing world with social enterprises that have been through the GSBI programs.

Collectively, these Miller Center programs are helping a wide range of social enterprises across the globe that are aimed at eradicating poverty. Increasingly, as the impact of climate change grows, these social enterprises are working at the community level on issues that fall under the category of climate resilience.



Global Alliance for Clean Cookstoves

The [Global Alliance for Clean Cookstoves](#) (GACC) works to save lives, improve livelihoods, empower women, and protect the environment by creating a thriving global market for clean and efficient household cooking solutions.

Millions of people worldwide rely on traditional open fires and inefficient cookstoves that use solid fuels such as wood, coal, or dung. These cooking methods cause air pollution, smoke-related illnesses, deforestation, and loss of biodiversity. Reliance on open fires, inefficient stoves, and solid fuels places economic burdens on families, especially women and girls who spend time collecting fuel or cooking for their families rather than going to school or participating in the paid economy.

GACC acts as a mobilizing force in the area of clean cookstoves, working on everything from enhancing demand for clean cookstoves and fuels; supporting innovation to strengthen

the supply of clean cookstoves and fuels; and fostering the enabling environment for a thriving market for clean cooking solutions.

GACC has worked with Miller Center and the GSBI in a number of ways to help improve its operations and impact. GACC wanted focused attention to help local cookstove manufacturers and retailers develop stronger social enterprises, so they worked with the GSBI to jointly develop [GSBI Boost workshops](#), to accelerate early-stage social entrepreneurs working in the area of clean cookstoves. In the pilot program alone, GSBI Boost worked with 98 cookstove social enterprises in five countries (Kenya, Bangladesh, Ghana, Uganda, and China).

The successful partnership continues. In 2015, 50% of the social enterprises receiving GACC funding had successfully completed a GSBI program.

Pathways to Building Climate Resilience

Within the climate resilience domain, GSBI social enterprises have shown particular strength via three pathways:

Energy

Energy poverty — which means not having sufficient and/or reliable energy to meet basic needs — is prevalent in much of the developing world, and climate change will only worsen this problem. One billion people have no electricity for lighting, communications, cooling, and other needs; another one billion or more live with unreliable electricity. Between two billion and three billion people cook and warm themselves under primitive conditions. Climate change will make conventional sources of power even more difficult to implement.

Energy innovations can take the form of renewable energy, sustainable lighting, and self-generated power. From the perspective of social entrepreneurship, the more than 500 million households, communities, and small enterprises that suffer from energy poverty represent the potential market for energy innovations.

Water

Water poverty is analogous to energy poverty — not having sufficient access to water or water of adequate quality to meet basic needs. Water sources are becoming scarcer, creating even more water insecurity than much of the world already faces. Contaminated water affects health; arsenic in the ground water is lethal; lack of water jeopardizes agricultural crops and livestock; and water scarcity creates distribution problems.

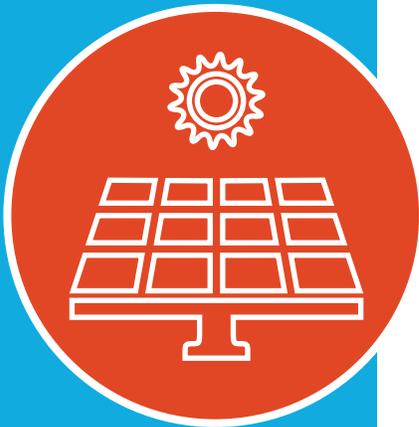
Water scarcity is another burden that falls disproportionately on the shoulders of women and children, who are usually responsible for fetching it. As clean water becomes harder to find, people will need to be more creative in their water sources, filtering water that may be contaminated, implementing grey water recycling systems, and finding new sources such as using rain catchments.

Sustainable rural development

Crop patterns will certainly change with increased or decreased rainfall, more frequent or prolonged droughts, and saltwater flooding. People will become less able to feed and sustain themselves, which means that new avenues must be created to maintain livelihoods at the base of the pyramid.

With decreasing ability to feed and sustain themselves, rural populations will increasingly migrate to urban areas—leading to overtaxing of already stretched urban resources, all the problems of overcrowding, and abandonment of the agricultural areas upon which cities also depend for their food.

The following are examples of GSBI social enterprises working successfully at the community level in each of these pathways toward climate resilience.



Energy

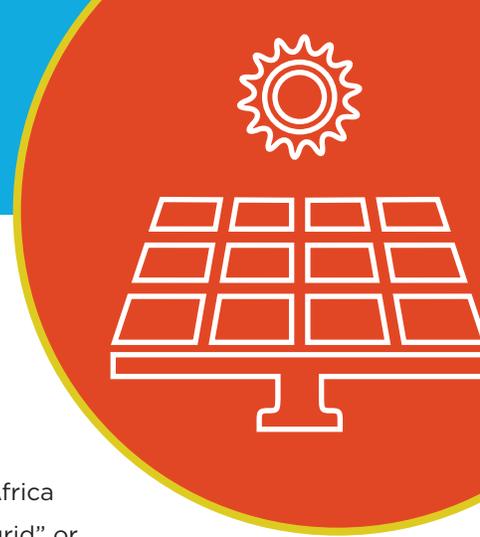
Solar Sister is a women's entrepreneur network designed to improve energy access in Uganda, Tanzania, and Nigeria while empowering women with economic opportunity. Solar Sister combines the breakthrough potential of clean energy technology with a deliberately woman-centered direct sales network to bring light, hope, and opportunity to even the most remote communities in rural Africa.

Already, more than 2,000 Solar Sister Entrepreneurs are active in three countries, acting as role models of women in business and the technology industry. Solar Sister reports that **women invest 90% of their income** into their families' well being.

Solar Sister promotes climate resilience in ways that include:

- **Reduced fuel use:** More efficient cookstoves reduce fuel use by 30% to 60%, resulting in fewer greenhouse gas and black carbon emissions and reducing impacts on forests, habitats, and biodiversity.

- **Enhanced energy access:** Solar power has the potential to reach the 600 million people in Africa who live "off-the-grid" or without reliable electricity.
- **Increased household prosperity:** Energy savings mean money can be reinvested in lifting a family out of poverty. Solar Sister also offers opportunities for solar-powered businesses such as phone charging to boost household incomes.
- **Improved health:** Solar lamps replace kerosene, which produce toxic fumes, black carbon, and increased risk of burns. It's a little-known fact that more than 4 million deaths each year are attributed to the use of kerosene lanterns and cookstoves.
- **Better education:** 4+ hours of solar light means more time for students to study.



Empower Generation builds clean energy markets for Asia's energy poor by connecting women entrepreneurs with solar technology suppliers. Operating in Nepal, one of the poorest countries in the world, Empower Generation offers sustainable employment to women otherwise vulnerable to slavery, while enabling the widespread adoption of clean energy solutions in remote areas through market-based approaches.



Photo credit Empower Generation



Green Energy Biofuels started in Nigeria and is now spreading across West Africa. Green Energy Biofuels is scaling renewable ethanol for clean cooking. The social enterprise's stove and biofuel gel is produced from waste using indigenous technology. It is safer, cleaner, and more cost-effective than kerosene, a petroleum-based product that creates indoor air pollution, causes respiratory disease and deaths, and contributes to global warming.



Photo credit Empower Generation

Water

Naandi – which in Sanskrit means “new beginning” – works to bring safe water to India’s villages and communities. Recognizing that poverty is usually linked inextricably with water availability and quality, Naandi has as its ultimate goal the eradication of poverty.

In India, water provision is the mandate of state governments and is often perceived as a public responsibility. The public sector, however, has generally failed to provide high-quality water and the degree of government intervention and control has made the sector unattractive to private companies. Most private initiatives have focused on household-level water treatment for middle- and high-income urban households.

Naandi has developed a replicable design for community-scale water treatment plants, whereby villages each have a clean water point where municipal water is cleaned using either reverse osmosis or ultraviolet (UV) technology. The clean water is then sold to customers at very affordable prices through a subscription model.

The subscription model ensures that customers use safe water daily, which reduces the risk that they will mix contaminated water with their clean water. Naandi’s subscription model also encourages consumers to use clean water consistently – and to gain the benefits of using safe water.

Other GSBI social enterprises in the water pathway include:

Nazava Water Filters in Indonesia

sells a highly effective low-cost household water filter that allows households to filter their own tap, well, river, or rain water. Nazava’s Tulip water filter replaces the need to boil or treat water, producing clean, bacteria-free water using no electricity. Since the end of 2009, Nazava Water Filters has provided more than 160,000 people with access to safe drinking water through 60 resellers in more than 50 cities in Indonesia.

Jibu provides a comprehensive, turnkey startup package for local entrepreneurs to start their own neighborhood businesses by treating and packing water in reusable bottles. Jibu operates in the Democratic Republic of the Congo, Rwanda, and Uganda.



Photo credit Naandi Foundation



Sustainable Rural Development



Sistema Biobolsa is a patented prefabricated biodigester system that transforms the manure of animals into biogas and a potent, natural fertilizer. Through fermentation, the biodigester systems produce biogas that can be used in cookstoves. By inputting their animals' manure in the system on a daily basis, small and medium-scale farmers can develop and grow their crops, improve their energy security, improve their economic viability, and protect the environment.

The Sistema Biobolsa innovation is the creation of biodigesters that are prefabricated, high-quality durable goods that can be easily deployed and installed. The biodigesters can be paired with a full line of gas use products such as generators, stoves, and boilers. Sistema Biobolsa also offers comprehensive training and outreach programs that allow farmers to improve their yields through the use of the high-quality organic fertilizer produced by the biodigesters, and to maximize the benefits from the biogas produced.

Sistema Biobolsa biodigester systems promote climate resilience by:

- Transforming greenhouse gases methane and CO₂ emitted during farming activities — both contributors to global warming — into renewable energy sources
- Transforming poor farm waste management practices into protection of water sources and reduction of sanitary risks

- Reducing the use of chemical fertilizers, to remediate soils, boost the productivity of harvests, support more vigorous plants, and restore crop cycles
- Enabling farmers to possess their own production of renewable energy, which reduces overall fuel costs by not having to purchase fossil fuels and chemical fertilizers
- Replacing wood fuel, thus removing toxic smoke contamination in kitchens, reducing the risk of chronic respiratory sicknesses, and protecting local forests

Sistema Biobolsa serves agricultural markets in Mexico and other countries in Latin America. Its more than 2,200 biodigesters installed to date — in small and medium farms, backyard farms, slaughterhouses, and community centers — have achieved:

- Treatment of more than 150,000 tons of waste
- Production of more than 4,500 tons of biogas
- Mitigation of more than 17,000 tons of CO₂
- Production of more than 350,000 tons of bio fertilizer



Komaza works to get dryland farmers — the poorest people on earth — out of extreme poverty through innovative forestry: helping families plant trees for a dollar that are later sold for \$30. Dryland farmland suffers from bad soils that get little rainfall—conditions expected to worsen with climate change. Komaza’s business also addresses Africa’s multibillion-dollar wood supply crisis.



Carbon Roots International offers an innovative, market-based social enterprise model in northern Haiti that addresses deforestation, energy security, rural poverty, and job scarcity. Carbon Roots International encourages and enables the adoption of sustainable charcoal technologies in Haiti and the broader developing world, with a viable model for the deployment in rural areas of a sustainable soil amendment known as biochar, as well as the production of green charcoal, a renewable charcoal cooking fuel.

Eco-Fuel Africa in Uganda is dealing with the stark realities that of the country’s 35 million people, 80% are farmers living in poverty; 75% of the forest is already lost; and cooking fuel consumes 40% of the average household income. Eco-Fuel Africa produces green briquettes: a simple, better, cleaner, and less expensive form of cooking fuel made from locally sourced agricultural waste, made available through an inclusive distribution model.





CONCLUSION

Climate resilience is the capacity of a human community or ecosystem to:

- ➔ Absorb stresses and maintain function in the face of the external stresses wrought by climate change
- ➔ Adapt and evolve more sustainable social and ecological systems
- ➔ Prepare more effectively for future impacts of climate change

Of all the possible responses to global climate change, social entrepreneurship holds particular promise for fostering climate resilience in the developing world. In tandem with international treaties and national policies for reducing greenhouse gas emissions and improving the future global climate picture, social entrepreneurship can provide essential solutions to the world's poor, right now. In creating robust pathways to climate resilience, social entrepreneurship works to foster livelihoods, create local markets, and strengthen local institutions.

Miller Center for Social Entrepreneurship at Santa Clara University — through its GSBI programs, Impact Capital investment group, and Education and Action Research activities — is demonstrating the potential for community-based social enterprises to put climate resilience within reach of poor populations worldwide.

There are numerous real-world examples of Miller Center social enterprises making a real difference in climate resilience throughout the developing world. These examples can act as inspiration for additional social entrepreneurship efforts.



Photo credit: Carbon Roots International

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**Santa Clara
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Miller Center
for Social Entrepreneurship

Founded in 1997, Miller Center for Social Entrepreneurship is one of three Centers of Distinction at Santa Clara University. Miller Center accelerates global, innovation-based social entrepreneurship in service to humanity. Its strategic focus is on poverty eradication through its three areas of work: The Global Social Benefit Institute (GSBI®), Impact Capital, and Education and Action Research. To learn more about Miller Center and its social entrepreneurship programs, please visit www.scu.edu/MillerCenter.