

CASE STUDY



Empowered lives.
Resilient nations.

Empowering Communities

Renewable Energy and Energy Efficiency in the Caribbean:
Case Study of the Japan-Caribbean Climate Change Partnership



Background

Even though the Caribbean region is uniquely positioned to benefit from renewable energy solutions such as solar and hydropower, historically, this region has been highly dependent on fossil fuels for energy production. This is changing. Various Caribbean governments are working to reduce their dependence on fossil fuels and provide their communities with more reliable, efficient energy options to propel sustainable development and reduce poverty gaps.

This shift is partially due to various studies confirming that access to reliable energy sources can reduce

the divide between rural and urban communities and promote further economic growth¹. Currently, rural and farming communities are unable to implement the required technologies to improve their energy efficiency, benefit from renewable resources and reduce their dependencies on fossil fuels. This case study looks at the steps taken to employ renewable energy practices in two distinct communities: an indigenous community located in the hinterland of the Republic of Suriname and farming communities in Saint Vincent and the Grenadines.

Powering Development

The UN Development Programme's Japan-Caribbean Climate Change Partnership (UNDP J-CCCP) partnered with the Amazon Conservation Team (ACT) in the Republic of Suriname, and the Ministry of Agriculture, Forestry, Fisheries and Rural Transformation/Animal Health and Production Division in Saint Vincent and the Grenadines whereby two projects were executed, which focussed on renewable energy and energy efficiency.

The Suriname Example



Map showing the location of Pelelu Tepu

The Village of Pelelu Tepu, a remote indigenous community only accessible by chartered flight, was dependent on a generator and diesel to power the entire 84-household community. With this outdated system, the villagers only had electricity for 8 hours per day. This impacted the quality of education available, the quality of life of the villagers, and made day-to-day tasks more difficult. Additionally, due to the remote location of the village, sourcing fuel for the generator was an expensive and laborious process.

Due to this unreliable supply, the villagers expressed their need to have greater access to reliable energy supplies. The ACT lobbied for finances and found a partner in the UNDP. The two agencies worked together on a joint project designed to provide the villagers of Pelelu Tepu with a consistent supply of energy that could positively impact their lives. This occurred through the installation of a 75 solar photovoltaic (PV) panel system and capacity building of the community members by educating them on the importance of energy efficiency and the maintenance of the 16 Watt KVA system.

¹ [http://www.un.org/millenniumgoals/pdf/AGECCsummaryreport\[1\].pdf](http://www.un.org/millenniumgoals/pdf/AGECCsummaryreport[1].pdf)

The UNDP J-CCCP/ACT project was officially titled, 'Women Empowerment and Renewable Solar Energy Pilot Project'. Before the project, two villagers – Ketoera and Anna, travelled to India to be trained in the installation, repair and maintenance of solar PV systems. The design and installation of the renewable solar PV system was completed by Interdata, while the government of the Republic of Suriname/DEV supported the project through the provision of the current distribution network. During the project, Ketoera and Anna provided training to fellow community members, as well as to members of other villages. The community now assists with the maintenance

of the renewable solar PV system that provides the community with 24-hour energy.

The project challenged gender stereotypes by empowering female technicians to install solar panels and allowed women to play a leading role in the project. The village now serves as an example for other rural communities and has taken a big step to reduce the gap between rural and urban quality of life. Additionally, community members are now aware of the importance of securing funds for maintenance; and ACT continues supporting the community by securing these funds through income generating activities.

The Saint Vincent and the Grenadines Example

Climate change was negatively impacting farmers in Saint Vincent and the Grenadines. Farming communities were afflicted by declining incomes due to increased intensity and frequency of the dry period. Additionally, farmers were plagued by high energy costs and a dependence on fossil fuel. The farming community requested the assistance of the government, who also has a mandate to promote energy-saving practices and reduce fossil fuel reliance. As these two objectives aligned, the Climate Change Adaptation Project for Livestock Production Project was conceptualised.

This project, which included 20 farmers, was designed to reduce each farmer's vulnerability to the effects of climate change, by constructing small water harvesting systems on small livestock holdings to harvest rainwater for later use. The project procured pelletizers to produce high quality forage for periods of droughts or floods, and provided resilient tropical breeds of goats to support the growing goat milk industry. Finally, as it relates to energy efficiency and renewable energy, the project installed two biodigesters on pig farmers' holdings to convert waste into renewable energy in the form of methane gas. The remaining bi-product from the process can then be used as organic fertiliser.



Pictured above is a large component of a biodigester system which uses a bag to allow for an easier installation process.

Unfortunately, the cost of renewable technologies – specifically installing biodigesters – has been a deterrent to farming communities, with many farmers being unwilling to invest without tangible proof of the benefits. The biodigesters will also be used in two demonstration farms so that farmers and other agro-stakeholders can see first-hand the benefits of the technology. The project improved on previous models and addressed misperceptions that some farmers had as it relates to the practical uses and benefits of biodigesters. This practical example can encourage investment and support for the purchase of additional biodigester systems.



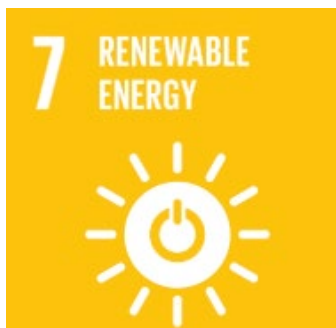
Pelelu Tepu villagers



Vincentian farmers discuss the use of biodigesters

The Forest and the Farm: Impacts of the Projects

Although the two projects were implemented in different environments, they both made a substantive impact in the livelihoods of the two communities. These projects also provided participants with the knowledge and skillsets to power their own development. The diverse projects were able to achieve results under Outcome 2 of the J-CCCP mandate, which is adoption and implementation of mitigation and adaptation technologies. Additionally, the projects address some of the Sustainable Development Goals (SDGs) as outlined below:



Goal 7: Affordable and Clean Energy

- Both projects created systems which provided beneficiaries with clean, reliable energy solutions (e.g. Solar PV system and Biodigesters).



Goal 12: Responsible Consumption and Production

- In Saint Vincent and the Grenadines, the biodigester allowed for the creation of a renewable energy source that not only reduced waste but also aided in the production of food products and better food preservation (e.g. coconut oil, dried fruit and pepper production).



Goal 13: Climate Action

- In the Pelelu Tepu example, community members educated others in the community and surrounding villages on the installation and maintenance of a reliable source of energy.
- In Saint Vincent and the Grenadines, the planned implementation of the ‘demonstration farms’ with the support of the Ministry of Agriculture will be used for training to support wider adoption of the technology; which, if adopted, will reduce their dependence on non-renewable sources of energy.

Reducing the Poverty Gap

Inclusive economic growth is one of the most effective means of reducing poverty and promoting development. However, for this economic growth to be achieved, communities seeking this growth must have access to a reliable supply of energy.

The Republic of Suriname project showcases the ability to improve the development of communities through the provision of reliable energy. The project instituted the technology and techniques necessary to harness renewable energy and improve energy efficiency. Solar powered electricity allowed the village to improve their quality of life by powering refrigeration for safer storage of food; their livelihood by powering small processing equipment for income generating activities; health

care by facilitating improved medicine storage and education by providing light for night time studies.

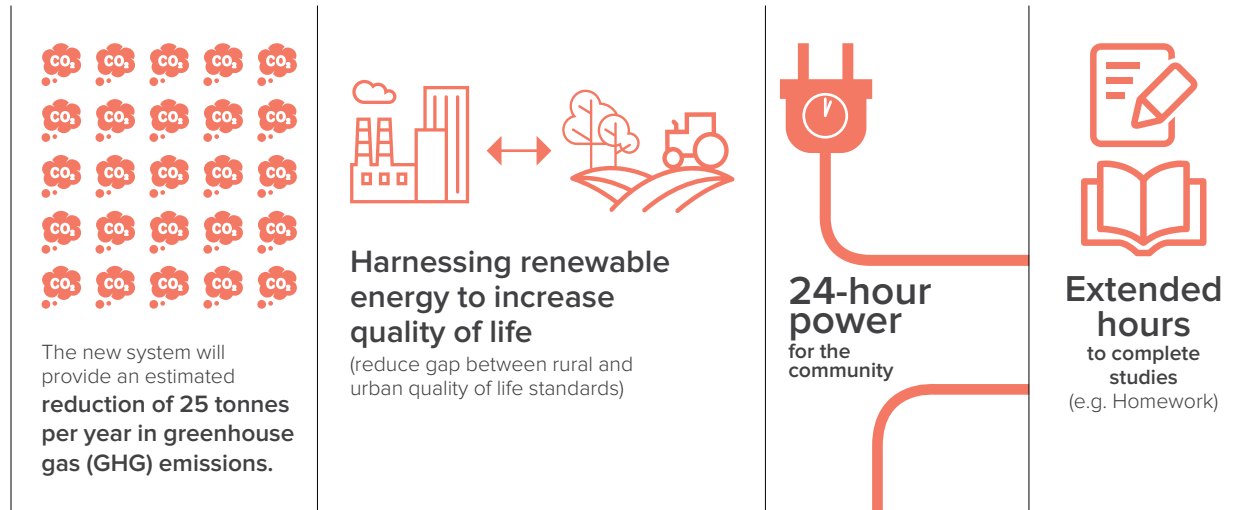
In the case of Saint Vincent and the Grenadines, the biodigester provided farmers with an energy source necessary to increase their product range. Before the renewable energy supply, farmers explained that their heating came from wood fire. This heat supply could not reach the temperatures required to manufacture additional products needed for business expansion. With the use of the biodigester however, farmers in the community are now poised to improve their livelihood and capacity for wealth creation through the product diversity and business expansion that the renewable energy source provided.



Solar PV system installed in Pelelu Tepu

Suriname

Outcomes of the Women Empowerment and Renewable Solar Energy Pilot Project



Saint Vincent and the Grenadines

Outcomes of the Climate Change Adaptation for Livestock Production Pilot Project



Insights & Take-aways:

Collaboration between farmers and technicians can improve buy-in and efficiency of projects.

In the case of the biodigester, a representative from the German company based in Grenada which installed the equipment directly interacted with the farmers to address technical issues. The company formed a regional WhatsApp group which allowed for the South-South transfer of knowledge and provided practical solutions for problems which many farmers faced. Additionally, a representative conducted a follow-up assessment after installation which allowed for minor problems to be addressed and the equipment to be tweaked to the specifications of the farmers. The group also benefitted from the knowledge of the farmers who were able to adjust the biodigester systems to meet site specific needs and advise other farmers on ways in which they could optimise their systems.

South-South training can be used to build capacity.

This occurred when a Vincentian Agricultural Officer travelled to Grenada and received training in order

to build capacity in the Ministry of Agriculture and continue to work with local farms to use, install and maintain biodigester systems.

The involvement of the community can help reduce the urban-rural gap.

The community involvement in the Pelelu Tepu project increased buy-in and allowed for the project to be completed successfully.

Gender-biases can be overcome through open communication and the support of community leaders.

This was witnessed in the Pelelu Tepu Project. Despite some negative reactions from men in the community, the village leader allowed the two women to head the project and supported their role. The elder's position encouraged men who were previously against the project to also support the women in this venture.

Best Practices

Several best practices have been identified in the two projects as outlined below:

South-South Transfer of Knowledge	Intimate Involvement of Service Providers	Community Involvement	Continuous NGO Involvement	Training in Native Language
<ul style="list-style-type: none"> Biodigester training in Grenada partnering with GIZ. Sharing information via a regional farmers' WhatsApp group. The creation of 'demonstration farms' which provided practical examples to farmers which improved buy-in. Community members training others. Pelelu Tepu villagers educating surrounding villages. 	<ul style="list-style-type: none"> Allowed for ease of adjustments/follow up visits. Provided practical solutions to community needs. 	<ul style="list-style-type: none"> In the case of Pelelu Tepu, the community was involved in the project, which allowed for greater knowledge sharing, higher employment and improved technical skills to propel the community's own development. The community's involvement promoted greater buy-in and contributed to the overall success of the project. In Saint Vincent and the Grenadines, the 'demonstration farms' have provided a hub for the farming communities to interact and learn about the benefits of renewable energy. 	<ul style="list-style-type: none"> The continuous involvement of NGOs was also a success for the project. ACT had a station manager in Pelelu Tepu, which made it easy to communicate with community members and to complete the day-to-day work. The development of a trusting relationship between the community and ACT aided the successful implementation of the project. 	<ul style="list-style-type: none"> The residents of Pelelu Tepu speak their own native language and it became evident that more efforts are needed to teach/educate communities in native languages in order to increase the number of persons who can benefit.

Final Thoughts

Renewable energy and energy efficiency are integral to the successful transformation of rural and farming communities. It is evident that the provision of consistent, affordable, clean energy allows for economic development which can reduce the urban-rural gap.

In Saint Vincent and the Grenadines, the two biodigesters were a benefit to both the farmers and the environment, and definitely a move in the right direction. However, it is important to note that the cost to implement these systems on an individual basis is restrictive. Therefore, it is necessary for support and subsidies to assist farmers in installing additional biodigesters in the future.

The Republic of Suriname project was implemented in a remote area with a relatively small population. The project was up-scaled to include two other communities, and provides a model for replication in

other communities in the future. Even though the project was a success, to sustainably maintain the renewable energy system an income generation component will need to be attached to the electrification. The proposed next step is to design a village wide project for income generation, to aid in the maintenance of the system, provide a viable source for potable water and propel the development of the community.

While mitigation measures may need to be considered in the two projects, overall, the communities in both the Republic of Suriname and Saint Vincent and the Grenadines have used renewable energy to improve their lives and their livelihoods.