

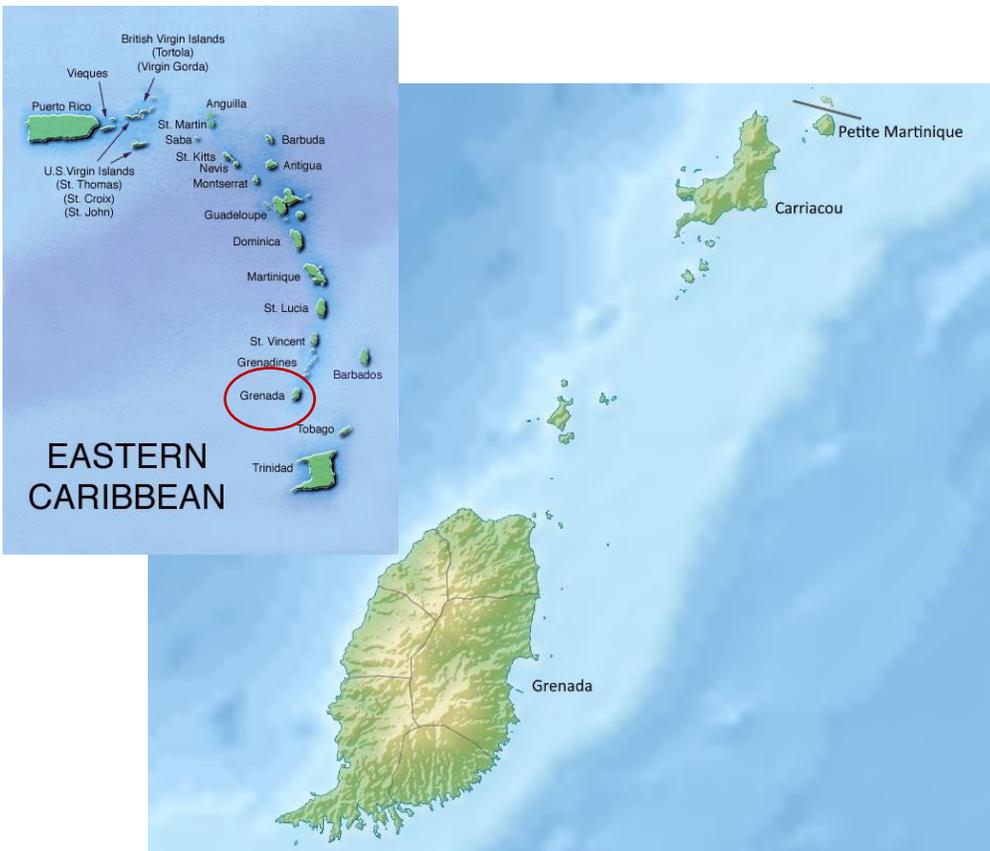


Petite Martinique Women in Action (PMWIA): The introduction of aquaponics for sustainable food crop production by women in the community of Madam Pierre, Petite Martinique, Grenada

CASE STUDY #6: Innovation and best practices in marine and coastal governance and management by civil society in the Caribbean

Introduction

Local food production is good for local economies, but in small islands like Petite Martinique that have scarce water resources, some degree of innovation is needed to grow crops year-round. The smallest of the islands that make up the tri-island state of Grenada, Petite Martinique has an area of 2.5 km² and a population of about 900 people who live mainly in coastal villages. It is located just north of Grenada and is accessible only by boat.



The tri-island nation of Grenada comprises Grenada, Carriacou and Petite Martinique.
© Uwe Dederig & AACaribbean (inset)

This case study showcases the results of a small grant under the Caribbean Sea Innovation Fund (CarSIF) facility. The Caribbean Natural Resources Institute (CANARI) established the CarSIF facility to address priority needs and actions for marine and coastal resources governance and management in the Caribbean. The CarSIF small grants awarded between 2019 and 2020 are a key component of the regional project 'Powering Innovations in Civil Society and Enterprises for Sustainability in the Caribbean (PISCES).

PISCES is funded by the European Union EuropeAid programme and implemented over three years from 2017 to 2020. PISCES is being implemented by CANARI, in partnership with the Caribbean Coastal Area Management Foundation (C-CAM), the Caribbean Network of Fisherfolk Organisations (CNFO), the Environmental Awareness Group (EAG), and the Fondation pour la Protection de la Biodiversité Marine (FoProBiM), the Saint Lucia National Trust (SLNT) and Sustainable Grenadines Inc (SusGren). PISCES targeted ten countries: Antigua and Barbuda; The Bahamas; Dominica; Grenada; Haiti; Jamaica; Saint Kitts and Nevis; Saint Lucia; Saint Vincent and the Grenadines; and Trinidad and Tobago.

Petite Martinique has no rivers or streams, so residents have traditionally relied on rainwater harvesting for fresh water and, more recently, on a newly installed desalination plant that provides water for domestic and commercial use. Heavy reliance on rainwater makes the island vulnerable to drought. This vulnerability is increasing due to changes in weather patterns resulting from climate change. Water harvesting and reliable water storage systems are essential for the people of Petite Martinique. Due to limited water resources and harsh temperatures that can destroy young plants before they mature, food crops are only grown on a small scale on the island. As a result, most food is imported into the island, and fresh food is very limited.

One group that has been taking steps to increase the availability of fresh food is Petite Martinique Women in Action (PMWIA). Operating out of the community of Madam Pierre since 2016, PMWIA is a local civil society organisation that aims to empower women and youth on the island through gender balance initiatives and livelihood creation geared at sustainable economic development.

Taking growing conditions on Petite Martinique into account, PMWIA opted to produce vegetables commercially using a greenhouse and aquaponics system powered by solar energy. The system combines greenhouse farming, hydroponics and aquaculture, allowing the women and youth farmers of PMWIA to produce food year-round, including during periods of water scarcity. The system produces approximately 400 pounds of leafy green vegetables and other short crops each quarter for sale on the local market in Petite Martinique. The fish in the aquaponics system are not reared for sale, but rather to provide fertiliser for the plants.

PMWIA's aquaponics system relies heavily on harvested rainwater. However, major challenges to the group's operations have been proper rainwater harvesting and adequate storage for harvested rainwater. Their rooftop capture capacity was constrained by limited roof space, and the system's two 1,000-gallon water storage tanks did not provide enough of a buffer during periods of severe drought. The 13-member PMWIA was awarded a CarSIF small and microenterprise (SME) microgrant to carry out activities from June 2020 to October 2020 to strengthen its physical infrastructure to enhance business operations.



Aquaponics is a combination of aquaculture and hydroponics in an integrated system. Waste produced by fish feeds the plants, and the plants clean the water for the fish, resulting in one continuous cycle. © Akeisha Clarke

Project Description

The project sought to increase water catchment and storage capacity for the aquaponics system operated by PMWIA. The main activities were:

- **Construction of a covered, raised platform** adjacent to the greenhouse to house the fish tanks and increase roof space for water capture. The fish tanks were relocated from the main greenhouse area and placed on the platform to enable gravity flow of water from the tanks to the grow beds.
- **Acquisition of an 800-gallon tank** for water storage.



*Left: Previous location of the fish tanks in the greenhouse. This area is being converted into additional growing space.
Right: Construction of the new platform where the fish tanks will be placed. © PMWIA*

Results

The improvements to PMWIA's water infrastructure through this grant have increased the sustainability of their operations in the following ways:

- **Increased rainwater catchment capacity.** By constructing a roof over the new platform, PMWIA increased the available roof area for water capture. Rainwater that would have been otherwise lost to surface runoff and infiltration into the soil can now be captured and channelled into water storage tanks. The roof has other benefits. It protects the gravity flow tank platform from water damage and shades the fish tanks of the aquaponics system from direct sunlight exposure. Shade protection decreases evaporation, helps moderate the water temperature, and inhibits the growth of algae that poses a risk to both the fish and plants in the aquaponics system.
- **Additional water storage capacity.** The 800-gallon tank procured under the project increased PMWIA's water storage capacity from 2,000 gallons to 2,800 gallons. The 800-gallon water tank provides supplementary capacity for the operation of the aquaponics system during drought periods on Petite Martinique. Stored water is used to replenish water taken up by the plants and lost to evaporation.

- **Expanded growing space.** By relocating the fish tanks from the greenhouse to the newly constructed platform, PMWIA freed up additional growing space in the greenhouse where the tanks had been previously housed. PMWIA estimates that the additional growing space will increase their capacity to produce an additional 100 pounds of vegetables per quarter through the addition of new grow beds.

These improvements to PMWIA’s operations are significant. Even though the aquaponics system is very water efficient, water is its lifeblood, and a reliable supply is essential.

Good practice

This CarSIF grant focused on **operational capacity building through infrastructure investment**. Infrastructure deficiencies negatively impact the profitability and performance of SMEs and limit growth potential. PMWIA has sought to address the water challenges in their aquaponics operations and improve their productive capacity.

Climate-proofing infrastructure and operations. Climate change projections for the Caribbean foretell a drier future and an increase in the frequency and intensity of extreme weather events. By shoring up its ability to harvest and store rainwater, PMWIA is taking steps to strengthen the climate resilience of its agriculture production system and prepare for future conditions. Water resources and catchment management are critical for the sustainability of Caribbean agriculture, even in small-scale, water-efficient systems like PMWIA’s aquaponics farm.



Completed platform area with roof that facilitates additional rainwater catchment for PMWIA’s aquaponics system. © PMWIA



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