

# CASE STUDY



*Empowered lives.  
Resilient nations.*

## Irrigating 'Eden'

Case Study: The Agricultural Water Resource Management Project  
(The case of Grenada, and St. Vincent and the Grenadines)



# Background

The Caribbean is known for its lush tropical landscapes, fertile lands and abundance of crops. However, this rich 'Eden' is adversely affected by climate change; droughts, floods and increasingly severe storms are the primary causes of decreased farming output and negatively impact the region's ability to provide food for its people.

This sentiment was reinforced at the seventy-third session of the United Nations General Assembly in 2018. Speaking for the Caribbean Community (CARICOM), Guyana's delegate underlined the urgent need to build resilience to shocks through climate sensitive agriculture, and highlighted the importance of water management schemes.

As it relates to water management and agricultural water sources, the Japan-Caribbean Climate Change Partnership (J-CCCP) implemented 16 projects to improve community-based water capacity and irrigation systems to test their ability to raise agricultural productivity. This case study will highlight two projects in Grenada, and in St. Vincent and the Grenadines respectively to mitigate some of the negative effects of the changing climate.



**Audrey Butler-Walters, J-CCCP beneficiary, stands on her farm which is now flourishing following installation of technical inputs**

# Project Overview

## [The Grenada Example](#)

Mirabeau, a town in the region of Saint Andrew, Grenada, is known for its fertile soil and agricultural prowess. Home to the agricultural wing of the TA Marryshow Community College (Farm School), this area contributes vastly to the agricultural sector on a national level. Although it is an agricultural mecca, Mirabeau is still adversely affected by harsh climate changes. The community was plagued by severe droughts which increased competition for water, with farmers being disproportionately disadvantaged. The Mirabeau Propagation Station, which provides agricultural water to the area, is supplied by a dam. This dam, while principally used by the station, is also utilised by the National Water and Sewerage Authority (NAWASA) during drought. During periods of water scarcity all available water is reallocated for potable purposes resulting in reduced irrigation and losses for farmers.

The station had a 20,000-gallon storage capacity but this was insufficient to support the needs of the station (approximately 70 acres of land) especially during the dry season generally experienced from January until May. Irrigation is critical for the short cycle crops as these are propagated during the dry season and farmers are dependent on the station for planting material. Water shortages in 2017 substantially impacted the station's ability to meet quotas for distribution to farmers. The station supplies approximately 750 – 1000 farmers across the island with seedlings/planting material. During this period of drought the station lost 10% of its tree crops and suffered substantial losses of short-term crops including corn, cassava and sweet potatoes. Due to these and other devastating effects, drastic measures needed to be taken to secure a reliable supply of agricultural water resources.

To mitigate some of these negative impacts, the J-CCCP funded the “Building Resilience to Climate Change and Weather Variations at Mirabeau Propagation Station” project. The project was designed to increase production and productivity of the Mirabeau Propagation Station by introducing and

mainstreaming climate smart practices and disaster risk management systems into the Mirabeau Propagation work programme.

The project was designed to improve water availability for irrigation through the construction of a rainwater harvesting and storage system for irrigation with the increased water storage capacity of 33,000 gallons. In addition to the improved capacity, the station will be installing more efficient irrigation systems on their own including micro sprinklers and drip systems which further reduce their water needs.



**Pictured above is a map of Grenada highlighting the town of Mirabeau**

The project was also designed to improve protective agriculture capacity through the construction and application of two new greenhouse management systems. But physical improvements were not the only benefits of the project – the J-CCCP, with the support of the Ministry of Agriculture also facilitated training programmes to increase the capacity development and project management skills of farmers and members of the community.

With respect to the sustainable maintenance of the upgraded systems, a draft manual for the maintenance

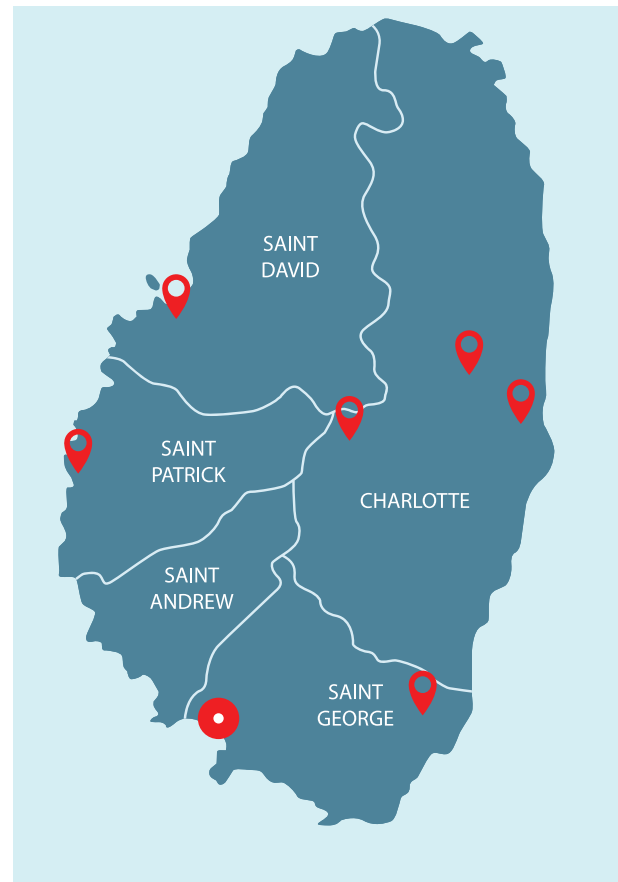
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### [The St. Vincent and the Grenadines Example](#)

St. Vincent and the Grenadines, known for its active volcano and fertile soil, is truly a paradise. But like the other territories of the Caribbean it still suffers from the devastating effects of climate change. Although the main island of St Vincent has a plentiful supply of ground water through rivers and streams, steady drying of rivers, streams and degrading water quality resulting from climate change is predicted to become a problem in the near future.

To bolster mitigation efforts and increase the island’s resilience to the negative impacts of climate change, The J-CCCP funded the “Irrigation Capacity Improvement to Improve Climate Resilience among Small Farmers” project. The project was designed to enhance farmers’ capacity to improve their climate resilience through the adoption of climate smart strategies, and to meet their economic needs through installation of irrigation capacities on and off farm. Spanning six communities (Langley Park, Grand Sable, San Souci, Barrouallie, Chateaubelair and Calder) the project provided individual water harvesting and irrigation systems designed and established to improve farm productivity. Farmers in these communities were also trained to reduce disaster-induced losses through the adoption of climate resilient and disaster risk management strategies on-farm. They were further instructed in the usage of irrigation pumps powered by solar photo voltaic systems to avoid CO<sup>2</sup> emissions and reduce the cost of operating pumps. Further to this, farmers were given access to disease resistant planting material (vegetables and citrus) and the capacity of nurseries were expanded (installation of screen houses and equipment and sourcing of disease and climate resilient germplasm).

In two of the communities (Langley Park and San Souci), the project designed affordable climate-resilient, community-based water harvesting, storage and distribution systems.



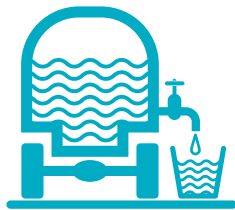
**Pictured above is a map of St.Vincent highlighting the areas of Langley Park, Grand Sable, San Souci, Barrouallie, Chateaubelair and Calder**

# Channelling Water Resources: Impact of the Projects

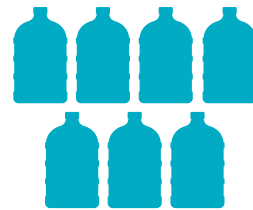
Although the two projects were implemented in different environments, they both made a substantive impact on the various farming communities. Before the project, farmers in St. Vincent and the Grenadines were forced to manually irrigate crops, which resulted in 2 to 3 hours several times a day in watering fields. This manual method meant that only small areas could be planted and reduced the quality of crop yield. While results varied in the different communities there was marked improvement at the completion of the project. The below chart highlights the main impacts of the projects in Grenada, and St. Vincent and the Grenadines.

## Grenada

Outcomes of the Project



Reduced reliance on the  
potable water system



Total available storage  
capacity at the station  
increased to 53,000 gallons



The station can now irrigate  
for an additional 4-6 weeks  
which will significantly  
reduce crop loss by  
approximately 10%



More efficient irrigation  
systems including micro  
sprinklers and drip systems  
which would further reduce  
their water needs

## St. Vincent and the Grenadines

Outcomes of the Project



### Increased crop yield

(farmer noted that after the irrigation project he reaped approximately 700/800 pounds as compared to approximately 60 pounds before)



### Increased profitability

(one farmer explained that before the consistent irrigation he was averaging \$200/300 in sales and this has increased to \$600/700 per week)



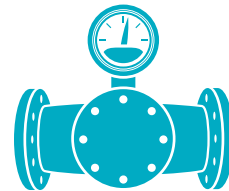
**Assisted one hundred and seventeen (117) farmers in three geographically distinct areas, operating on seventy-five (75) acres of lands**



**Increased diversity of crops available to be planted year round**



**The introduction of drip irrigation systems for water conservation**



**Inclusion of tensiometers to measure soil moisture and water meters to accurately determine water use**



**A Vincentian farmer**

The projects achieved J-CCCP's Outcome 2. In Grenada, the project addressed "the adoption and implementation of mitigation and adaptation technologies; as it relates to sustainable agriculture and community-based climate smart resilient infrastructure". While in St. Vincent and the Grenadines the project addressed "climate-smart community-based water management systems (harvesting, storage and distribution), crop diversification practices, water capacity and irrigation systems". These projects also addressed some of the Sustainable Development Goals (SDGs) as outlined below:



**Goal 2:**  
**Zero Hunger**

- The projects contributed to the long-term goal of sustainable food production systems and implemented resilient agricultural practices designed to increase productivity and production. They further strengthened the capacity for adaptation to climate change, extreme weather, drought and flooding.



**Goal 13:**  
**Climate Action**

- The projects boosted the water capacity of the two communities which strengthened their resilience and adaptive capacity to climate-related hazards (e.g. water shortages)

# Insights and Take-aways



**Government involvement is important to promote agriculture and climate action.**

In both projects the government took the lead. The active involvement of the government highlights to the public the importance of the agricultural sector and further showcases that the government is actively working to promote climate resilient initiatives.



**Community groups are key to sharing information with the larger community. In St. Vincent and the Grenadines, the project positively impacted the following groups:**

Women in Agriculture Langley Park Cooperative (WALCO), Langley Park Fair Trade Group (LPFTG), Grand Sable Fair Trade Group (GSFTG) and Rabacca Farmers' Cooperative. By educating these groups they can advocate for, and educate the community on, climate resilient practices.



**With the right investment, there is a possibility for agriculture in the region to be profitable and sustainable.**

The farmers saw increased profitability due to the projects. If more climate resilient techniques are implemented, it is likely that struggling agricultural sectors can bloom again.

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## Final Thoughts

Agricultural industries are as fragile as they are vital to an economy. In order to protect and bolster the agricultural industries and protect the livelihoods of farmers, it is necessary to implement projects and policies that support these sectors and mitigate some of the negative effects of climate change. These two projects focused on providing farming communities with adequate agricultural water resources and those that benefitted from the intervention flourished. It is important to promote climate smart technologies and practices across the region; Grenada and St. Vincent and the Grenadines clearly highlight the benefits

of improving water resources management in the agricultural sector.

**All beneficiary farmers who were interviewed were satisfied with the results of the project. One participant when asked how the project had impacted income, responded, “oh yeh, ah happy!” - a sentiment shared by all involved.**