

Contributing to Food and Nutritional Security in Saint Lucia
Medium Scale Aquaponics
(Giles Romulus & Jameson Alphonse)

Name of Project: Establishment of a network of sustainable eco-friendly youth aquaponics facilities which contribute to food and nutritional security in Saint Lucia.

Name of Grantee: Saint Lucia Agricultural Forum for Youth

Total Budget: US\$86,791.00

GEF SGP Grant: US\$46,337
Cash Co-funding: US\$22,676
In-Kind Co-funding: US\$17,778

Dates: November 2017 – September 2019.

Focal Area(s): Land Degradation & Climate Change.

Background

To understand the macro economic significance of food security for Saint Lucia, one must consider and understand the inordinate levels of food imports. In 2017, with a population of 178,844, food imports were valued at US\$929 million or 24.6%¹ of total merchandise imports. In that year, the trade deficit stood at US\$1.62 billion, in which food imports represented 45% of the total value of imports².

This dependency on food imports, when combined with the existential threats from climate change, places Saint Lucia among the top twenty most vulnerable countries of the world. Climate change is expected to bring intensification of natural hazards such as sea level rise, floods, drought, and wind speeds creating impacts, which will adversely affect food and nutritional security in Saint Lucia, due primarily to shortages.

Project Objectives and Key Activities

Within this context, the main purpose of the project is to move to soil-less agriculture or aquaponics. The project was proposed by the Saint Lucia Agricultural Forum for Youth (SLAFY), whose leaders include Mr. Jameson Alphonse. In 2014, Mr. Alphonse was seeking a way to increase production of lettuce, and through research and discussions, came across the science of Aquaponics. With his own personal investment, between 2014 and 2017, he built up a functional system which was energy intensive.

In 2017, the SLAFY received a grant from the GEF Small Grants Programme, which is implemented by UNDP, to significantly improve the efficiency of the system. The value of this new technology is the economic use of water created in a closed system and the symbiosis between fish in a tank and plants, with the fish providing rich nutritious non-toxic or close to organic fertilizer and in return receiving high quality water for their life cycle. In many ways, Aquaponics comes close to emulating the input-output-input inter-dependencies in ecosystems.

¹ <https://knoema.com/atlas/Saint-Lucia/topics/Foreign-Trade/Import/Food-imports>

² <https://atlas.media.mit.edu/en/profile/country/lca/>

The project also had two additional components: to establish a centre of excellence for training young people in this new technology and to diversify the income source by introducing tours for visitors.



In order to meet the SGP criteria for funding, the young farmer through his sole proprietorship (Green Haven Fresh Farm) signed a notarized agreement with the Inter American Institute for Cooperation on Agriculture (IICA), which ensured that the project would continue to receive technical assistance. A second notarized agreement transferred 30% of the net profits to the Saint Lucia Agricultural Forum for Youth (SLAFY), within one year of commencement of operations and sales, for a total period of 8 to 10 years. These funds will go towards further development of Climate Smart Agriculture Projects in Saint

Lucia for young people.



With SGP support, the project designed and installed an 8 KW grid-tied solar system; designed three prototypes with their respective break-even analyses for promotions and sale of services to customers; improved a rain water harvesting system; designed and constructed a portable aquaponics model for exhibitions; and designed and printed brochures. The project also supported the preparatory work for establishing a new income source, through tours and a mini-restaurant serving organic foods and fish.

As a result of the grant, in May 2019, the production facility was 95% fully functional and had become more efficient than it was six months prior. The training component was also available, and the tours component was in the pipeline.

Environmental impact

Through an 80,000 gallon tank which forms the basement of the production plant and is replenished through rain water harvesting, the system is self-sufficient in terms of water. With an estimated 500 gallons used to replenish the 32,000 gallon aquaponics recycling system per week, the system has enough water to last 40 months which is capable of producing 160,000 lbs of lettuce during that period, compared to 53,200 lbs from traditional forms of farming. The comparative gross revenue being US\$300,000 and US\$99,000.

Thanks to the use of solar energy for the entire system, the carbon footprint within one year is estimated to decline by 116,000 Kg of CO₂ and the cost of production reduced by over US\$3700 or US\$308 per month.

Socio-Economic Impact

After four months of optimal production, the system is on target to bring in a net profit of US\$12,063 at the end of 2019, before stabilizing at an annual net profit of US\$17,778 between

2020 and 2022. It also employs three persons full time with projections to employ 8 by 2020 and stabilizing at 12 in 2022, by which time the wage bill will stabilize at around US\$69,000 per year.

Capacity Building:

As of now, (May 2019) 128 students and over 50 persons have visited the site where they receive an immersion course in basic aquaponics. In addition, 3 people have been trained in the technology and SGP expects the number of persons trained to exceed 25 per year by 2020 and onwards. An integral part of the project is to develop the site as the centre of excellence for aquaponics in Saint Lucia within the next year.

Lessons Learned

There are six (6) major lessons which have emerged to date from project implementation, as follows:

- (i) *Lessons in the Chemistry of Aquaponics: Temperature, light and Ph are the most critical parameters in the system.* A slight drop in the temperature can kill all the fish instantly, which means that the constant monitoring of these variables are critical.
- (ii) *Infrastructure Lesson: Using gravity flow reduces the cost of energy and overall cost of production.* To ensure maximum use of gravity flow, it is recommended that larger pipes are used.
- (iii) *Market Selling Points: Plants from Aquaponics Systems grow faster, are tastier, have a longer shelf life and the production process is benign to the environment.* These are primary selling points in a growing market place hungry for organic products.
- (iv) *Research:* One must continue to undertake secondary and primary research over time in order to introduce new innovations, which improves the system's efficiency.
- (v) *Partnerships:* negotiating mutually beneficial partnerships, is an underused strategy, for increasing the flow of grant funds to young people with excellent ideas but no investment capital. It is also an empowering way in environments where commercial banks are not sympathetic to such projects.

Given the burden of debt in the Caribbean and the impacts of climate change, Caribbean people must become more and more dependent on closed system agriculture in the future, where parameters can be easily controlled and managed. Failure to do so, will reduce the options for future survival.