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TOWARDS A CARIBBEAN BLUE REVOLUTION

June 2019

SDGs:



Countries:

Antigua and Barbuda, Bahamas, Barbados, Saint Kitts and Nevis

Project Codes:

TCP/SLC/3601

FAO Contribution:

USD 463 000

Duration:

16 August 2016 – 30 June 2019

Contact Info:

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Implementing Partners

Fisheries Divisions of the Ministries responsible for Agriculture, Fisheries and Marine Resources of Antigua and Barbuda, Bahamas, Barbados, and Saint Kitts and Nevis.

Beneficiaries

Fish farmers; entrepreneurs interested in aquaculture and aquaponics; government line agencies involved in the development, promotion and management of aquaculture; and consumers in the Caribbean.

Country Programming Framework

CPFs 2016-2019 - *Antigua and Barbuda*: Government Priority 2: Small farmers/family farmers.

Bahamas: Government Priority 1: Food and nutrition security and safety, and Government Priority 2: Climate change and sustainable resource management.

Barbados: Government Priority 2: Food production and productivity.

Saint Kitts and Nevis: Government Priority 2: Food and Nutrition Security.



BACKGROUND

Aquaculture production by Caribbean Community (CARICOM) countries has been around five percent of total fish production in recent years. In most Caribbean Small Island Developing States (SIDS) aquaculture production is nearly insignificant, and the import of fish and fisheries products has risen by 35 percent in just over a decade. The growing population in the region, as well as a more demanding tourism industry and the ongoing promotion of healthier lifestyles and diets, has increased the demand for healthy, safe and high quality food, including fish and fisheries and aquaculture products. Public and private sector investments are required if the aquaculture sector is to develop in a viable manner in the Caribbean. The Governments of Antigua and Barbuda, Barbados, Bahamas and Saint Kitts and Nevis assign high priority to the development of the aquaculture sector, and in view of this, requested that FAO provide technical assistance to develop their aquaculture sectors. The project aimed to contribute to more efficient and inclusive food and agricultural systems in the four target countries, through sustainable development and management of the aquaculture sector, and the development of selected value chains.

IMPACT

More and better quality fish is available as a result of the project. In addition, the long-term impact of establishing an enabling environment for further expansion, especially through networking and technology transfer, will contribute to the growth of the sector.

It is expected that the support provided by the project will lead to increased farm production efficiencies, economic benefits, and alternative employment opportunities and incomes in the four target countries; and will contribute to improved food security and food import reduction; all key development objectives of the participating governments.

ACHIEVEMENT OF RESULTS

The production of fish in aquaponics was relatively new in the four participating countries. Through the project, the countries developed the capacity to upscale and implement further aquaponics; and the private sector was well engaged to become an engine of positive change.

Aquaculture and aquaponics demonstration and training facilities were established and operating at private farms in the four participating countries. The demonstration farms are functioning well and are actively producing vegetables and fish for sale; and will provide long-term training opportunities in each country.

A review of the aquaculture situation, available resources, value chains and opportunities for growth in Antigua and Barbuda, Barbados, and Saint Kitts and Nevis was carried out; and a report was produced for each country. These reports and overall assessments of the aquaculture value chain will be vital for the preparation of aquaculture strategic plans.

The aquaculture value chain was strengthened through activities that were implemented in the project countries, focusing on small and medium-sized enterprises (SMEs) to support the financial sustainability of aquaponic businesses. These included a regional workshop for participants from the four project countries, which improved their ability to operate aquaponic businesses, identify and exploit markets, and engage with other members of the value chain. In addition, major constraints to the supply chain were identified, which should provide guidance to future interventions of FAO, development agencies or government actors.

Aquaculture and fisheries value chain training materials for specific use in the Caribbean region were developed; as well as awareness-raising brochures and capacity-building books on aquaponics. A “master document” was prepared, which portrays the historical production, and social, financial and environmental aspects of aquaculture in the Caribbean; and is the first document of its kind. On the basis of this draft document, supporting documents are being prepared for regional partners and investment entities.



IMPLEMENTATION OF WORK PLAN

Long delays were experienced during the project. Some of these were internal, and others were caused by administrative issues with country stakeholders. In addition, relatively high procurement, involving many different vendors, required extensive administrative and technical reviews, and communication was not always sufficient to ensure timely delivery. Two no-cost project extensions allowed for the successful completion of the project.

Significant changes were made to the budget during the project; but overall, the activities were delivered within the project budget.

FOLLOW-UP FOR GOVERNMENT ATTENTION

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SUSTAINABILITY

1. Capacity development

The plan is for the governments to use the private farms as demonstration facilities. The collaboration established during the project strengthened these relationships. The demonstration sites provide long-term training sites for the governments to use, without creating additional financial burden, with long-term consequences for their budgets in terms of the maintenance of the sites. The purpose of using public-private partnerships (PPPs) in the project design was to embed the financial engine within a private company, to ensure that the demonstration facilities would continue after the project. It is expected that all demonstration sites will be maintained for the long term, with the owners reinvesting profits into the systems.

The project had a solid exit strategy, and the beneficiaries are fully capable and technically competent, and financially committed to continuing the demonstration facilities. In two countries, a separate project has picked up exactly where this project left off, and has an entire work plan for follow-up actions. For the other two countries, an ad hoc support strategy is in place for the beneficiaries, based on personal networking within and among project stakeholders.

2. Gender equality

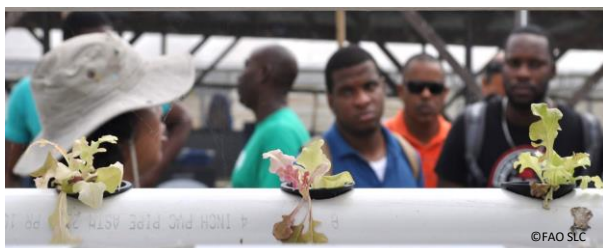
One of the four demonstration farms is owned/operated by a woman. Several women attended the workshops and are active in the sector; however, gender was not a specific objective of the project.

3. Environmental sustainability

Aquaponics is an excellent form of technology for environmentally sustainable food production. Equally importantly, it serves as a vehicle for environmental messaging.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

The project was designed to support capacity development (technically, business planning, networking) for SMEs in the aquaponic sector, especially targeting youth or young adults.



5. Technological sustainability

Aquaponic technology is highly appropriate and very flexible, and was well appreciated by stakeholders as a relevant practice.

Aquaponic practices need to be adjusted to the Caribbean environment (intense sunlight, risk of hurricane); and the training workshops and resulting publications gave participants the opportunity to share good practices and experiences.

All of the beneficiaries, specifically the PPP demonstration sites, are already carrying out project activities without further technical assistance.

6. Economic sustainability

The project was targeted at small and medium-scale entrepreneurs, who have the business acumen and financial means to implement this modern technology. In that sense, the products are affordable and the interventions proposed are economically feasible. For wide-scale adoption, however, resource mobilization or access to financing should be included in any follow-up projects or activities.



DOCUMENTS AND OUTREACH PRODUCTS

- ❑ Report of the FAO Technical Workshop on Advancing Aquaponics: an efficient use of limited resources. Saint John's, Antigua and Barbuda, 14–18 August 2017. FAO Fisheries and Aquaculture Report. No. 1214, Bridgetown, Barbados. FAO. 2017.
- ❑ Report of the FAO Technical Workshop on Advancing Aquaponics through Strengthened Value Chains. Christ Church, Barbados, 11–14 December 2018. FAO Fisheries and Aquaculture Report. No. 1256. Bridgetown, Licence: CC BY-NC-SA 3.0 IGO. FAO. 2019.
- ❑ <http://www.fao.org/blogs/blue-growth-blog/advancing-aquaponics-in-the-caribbean/en/>.
- ❑ Advancing Aquaponics in the Caribbean. FAO Fisheries and Aquaculture Newsletter No. 60. August 2019 (in press).

ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	To contribute to more efficient and inclusive food and agricultural systems in the Caribbean countries, through sustainable development and management of the aquaculture sector, increased farm production efficiencies, economic benefits, alternative employment opportunities and incomes in the Eastern Caribbean SIDS, strengthening food security, value chain and adding to food import reduction objectives of the participating governments		
Outcome	Small and medium-scale aquaculture and aquaponics farms that are producing more fish for the Caribbean people in an economically viable, ecologically sustainable and socially acceptable manner		
	Indicator		
	Baseline		
	End Target	The volume of fish produced in aquaculture in the four project countries will have increased. The production of fish in aquaponics is relatively new in the four countries and needs more time to fully develop. The demonstration farms developed with project support are (proven) economically feasible and operating effectively.	
Comments and follow-up action to be taken	The capacity development provided by the project resulted in better farm management and the introduction of new technologies. The demonstration farms are functioning well and producing (vegetables and fish). It is too early to measure the exact impact in terms of production gains; after two or three production cycles it will be possible to determine the impact realized (probably around mid-2020).		
Output 1			
National assessment of the aquaculture situation, value chains used and challenges and opportunities for sustainable growth of the sector			
Output 1	Indicators	Target	Achieved
	– Aquaculture assessment reports drafted. – Some 90 stakeholders have participated in the national workshops to validate and finalize the assessments in the three countries. – Three assessment reports published and disseminated at national level.	???	Yes
	Baseline	???	
Comments	The output was fully delivered. Reports and overall assessments of the aquaculture value chain were not previously available before the project activities. The reports will be vital in preparing aquaculture strategic plans. Follow-up activity for the development of aquaculture strategy is ongoing in Antigua and Barbuda under a different project. The major impediment is the low level of aquaculture in the three countries, as well as the lack of available information.		
Activity 1.1			
Review of the aquaculture situation, resources available, value chains and opportunities for growth in Antigua and Barbuda, Barbados, and Saint Kitts and Nevis			
Achieved		Yes	
Comments		In each of the three countries, an aquaculture sector review was carried out and a report was produced.	
Activity 1.2			
Organize national workshops to discuss the assessment			
Achieved		Yes	
Comments		In each of the three countries, the reports were developed through collaboration with country stakeholders from the Government, the private sector and academia.	
Activity 1.3			
Prepare, publish and disseminate the three assessment reports			
Achieved		Yes	
Comments		The reports were prepared and cleared by the Lead Technical Officer (LTO), but it was decided that publication as an FAO report was not necessary or appropriate. These reports were shared with country stakeholders directly. Elements of the report are published in the two regional workshop reports (Activities 2.2 and 4.2).	

Output 2	The tilapia aquaculture value chain is improved and the capacity of small to medium-scale aquaculturists and aquaponics small and medium-sized enterprises (SMEs) is enhanced to produce safe and high quality fish and aquaponics products for the domestic market		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Training materials developed that meet the local situation and circumstances. – 20 persons participate actively in the training. – Four value chain analyses carried out. 	???	Yes
Baseline	???		
Comments	This output was fully delivered, and the aquaculture value chain was strengthened through the three activities that were implemented in the project countries. The work focused on SMEs to support the financial sustainability of aquaponic businesses. Major constraints to the supply chain were identified, which should provide guidance to future interventions of FAO, development agencies or government actors.		
Activity 2.1	Develop aquaculture and fisheries value chains training materials for specific use in the Caribbean region		
	Achieved	Yes	
	Comments	Materials for training were developed and used during the regional training. Elements of value chains, health and safety, and food losses were included.	
Activity 2.2	Organize a regional (for the four countries) training on aquaculture value chain, analysis, approaches, methodologies and value chain development		
	Achieved	Yes	
	Comments	A regional workshop was held with participants from the four project countries, with the participation of three additional countries from a complementary project. The publication of the workshop report can be found at: http://www.fao.org/3/ca4335en/ca4335en.pdf	
Activity 2.3	Carry out a tilapia aquaculture value chain analyses and identify constraints to and opportunities for aquaculture value chains development in the four countries		
	Achieved	Yes	
	Comments	This analysis was carried out as part of the sector analysis and value chain review (Output 1), and finalized during the regional value chain workshop. The first published value chain for aquaponics was produced during this workshop. A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis for Caribbean aquaponics complements the value chain analysis.	
Output 3	Aquaculture and aquaponics demonstration and training facilities established and operating at private farms in the four participating countries		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Equipment purchased and constructions completed that enable demonstration farms to carry out the training activities. – Capacity-building materials sent and distributed among stakeholders/demonstration facilities. – Arrangements made between Fisheries Divisions/Departments of Marine resources and private SMEs. 	???	Yes
Baseline	???		
Comments	<ul style="list-style-type: none"> – Antigua and Barbuda: the private farm is fully operational and currently has about five full-time employees. FAO used this farm for the regional training component during the project. Procurement was limited to demonstration and training equipment (rather than the construction of new systems); and the focus in Antigua was empowering the farmers to become Master Trainers with capacity development and backstopping in the training programme. – Barbados: the demonstration facility is fully operational and the farmer is actively producing fish and vegetables for sale. The farmer is awaiting governmental selection of training participants and formalization of the contractual arrangements for long-term anchorage. – Bahamas: the Bahamas Agriculture and Marine Science Institute (BAMSI) had independently invested several hundred thousand USD in an aquaculture, hydroponic and aquaponic training and production facility. FAO used the relatively smaller resources for strategic procurement of items to strengthen the programme (e.g. student systems, improved air systems). The systems are currently fully operational and producing lettuce and tilapia for sale. Students have benefited, as the facility is an integral part of multiple courses (e.g. Introduction to Aquaculture, Aquaponics) offered by the tertiary education institute. – Saint Kitts and Nevis: the demonstration farm is fully functional, but is awaiting the procurement of fish fingerlings for the initial stocking. It is a challenge to import specific genetic stock of fish fingerlings to the country. The Government has however been supportive, and the private farmer is likely to purchase the fingerlings directly; and technical follow-up is being provided by FAO. The hydroponic portion of the farm is fully operational and actively selling to a nearby supermarket. 		

Activity 3.1	Procure the necessary equipment and carry out (as necessary) some small-scale construction works to enable at least four existing farms to function as demonstration and training facility		
	Achieved	Yes	
	Comments	The scope of this activity was narrowed to three countries (with Antigua and Barbuda removed), and was fully delivered. A new aquaponics training facility was built in Barbados (Adams Aquafarm) and Saint Kitts (Greenleaf Farms) through PPPs. In the Bahamas, an existing training facility was strengthened at BAMSI. The equipment was procured by FAO, with national partners carrying out the construction works.	
Activity 3.2	Identify and procure capacity-building materials of proven successful viable aquaculture production systems (e.g. aquaponics, greenwater tank/pond culture, cage culture), as necessary		
	Achieved	Yes	
	Comments	The primary aquaponics farmers (one for each country) received capacity-building materials for aquaponics.	
Activity 3.3	Arrange for public-private partnerships for at least two demonstration and training facilities farms – guaranteeing long-term capacity building and extension in aquaculture and aquaponics		
	Achieved	Partially	
	Comments	Private farmers in Barbados and Saint Kitts received equipment from FAO, and completed the construction and installation of the training facility. In Barbados, the Government has not yet signed an agreement with the farmer, to ensure a long-term programme. For follow-up, it is recommended that the formalization of the relationship be advocated. In the Bahamas, no suitable private sector farmers could be identified who were willing to take on the demonstration-farm-related training responsibilities. However, a public institution, BAMSI, was widely considered the best possible partner for the establishment and long-term operation of an aquaponics demonstration facility. Therefore, no PPP arrangement was needed for this country.	
Output 4	The capacity of SMEs in the aquaculture value chain has increased to produce more efficiently and be more competitive and profitable in the domestic market		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – 20 key stakeholders (private entrepreneurs and extensionists) trained in latest technologies and practices in aquaculture and aquaponics. – At least 50 persons in the four countries have been trained in basic aquaculture and aquaponics and assisted with advice in starting up or improving their businesses. 	???	Partially
Baseline	???		
Comments	During the regional training workshops in Antigua and Barbuda and Barbados the farmers were, among others, trained in feasibility assessment/business planning and value chains.		
Activity 4.1	Organize a regional aquaculture and aquaponics training of trainers for demonstration and training facility staff		
	Achieved	Yes	
	Comments	A regional aquaponics training of trainers' (ToT) workshop was held with participants from the four project countries. The publication on the workshop can be found here: http://www.fao.org/3/a-i7953e.pdf .	
Activity 4.2	Organize national-level basic training in aquaculture and aquaponics at the demonstration and training facilities		
	Achieved	Partially	
	Comments	The Bahamas held national-level training sessions for students and general public at BAMSI, with an FAO consultant providing backstopping support. In Barbados, the private farmer ran training courses for interested persons, as well as providing ongoing technical support to farmers who purchased systems from the company. In Antigua, there is a limit to how many people require training. In addition, projects from other agencies are supporting training in aquaponics at the demonstration sites that were supported by the TCP. In Saint Kitts, the first training session will be organized only after the farmer has received the required tilapia, but all the arrangements for delivering a technically sound training were put in place with FAO TCP support.	

Output 5	Aquaponics benefits for small-scale fish and vegetables production disseminated among youth and the general public		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – Four transportable aquaponics systems for demonstration constructed. – Demonstrations held at more than 20 schools and eight agricultural fairs. – Awareness-raising and promotional materials developed and distributed in the four countries at fairs and among schools. 	???	Partially
Baseline	???		
Comments	This output was deemphasized during the project. Aquaponics systems were present at all agricultural fairs without FAO expenditure, although FAO offered technical support to project beneficiaries.		
Activity 5.1	Demonstration of functional low-cost, low-risk, small-scale aquaponics systems in at least 20 schools to the youth and at eight national-level agriculture fairs		
	Achieved	Partially	
	Comments		
Activity 5.2	Development and distribution of promotional, awareness-raising and capacity-building materials on Low-cost, low-risk, small-scale aquaponics systems for schoolchildren and visitors of agriculture fairs		
	Achieved	Partially	
	Comments	Awareness-raising brochures and capacity-building books on aquaponics were distributed at two annual agriculture fairs (AGROFEST) in Barbados in 2016 and 2017.	
Output 6	An economically attractive and environmentally feasible investment proposal/business case for a Caribbean Blue Revolution for development bank – private sector funding		
	Indicators	Target	Achieved
	<ul style="list-style-type: none"> – An investment proposal developed that is economically and technically sound, in line with Blue Growth goals and attractive for public and private parties. – An attractive investment/business proposal presented to relevant partner agencies and potential investors. 	???	Partially
Baseline	???		
Comment	The “master document” was prepared, which portrays the historical production, social, financial and environmental aspects of aquaculture in the Caribbean; and is the first document of its kind. The scope of the document was beyond the scale of the TCP; which only covered four countries, while the proposal looks at the wider Caribbean. The draft is currently undergoing internal review and clearances, which will be followed by a strategic plan on who/how best to circulate. The individual case studies, working documents and business plans are offshoots of the master document, and will be prepared as necessary.		
Activity 6.1	Develop a draft economically and environmentally feasible investment proposal/business case for a Caribbean Blue Revolution, in partnership with key regional and national organizations, including development banks		
	Achieved	Yes	
	Comments	A draft proposal/business case was prepared, which was developed through a Letter of Agreement with an active partner. The service provider accomplished all of the planned outputs, but given the nature of the document, internal procedures and strategic planning are required before further circulation is carried out. From this draft, supporting documents are being prepared for regional partners and investment entities.	
Activity 6.2	Organize a regional (for the four countries) training on aquaculture value chain, analysis, approaches, methodologies and value chain development		
	Achieved	No	
	Comments	The proposal/business case for the “Caribbean Aquaculture Development Fund” will be circulated following internal clearances and the development of a strategic plan, which is currently under way.	

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