

**Name of the microproject: Climate Smart Livelihoods – Development of a Hydroponics System**

**Date of report: 02<sup>nd</sup> March, 2023**

**Responsible for the report: Carysse Baird (Community Liaison and Volunteer Engagement Officer)**



*Figure 1 Participants transplanting Pak Choi into the hydroponics system (09th February, 2023).*

### Brief description of the microproject

The micro-project aims to develop and foster a climate-smart sustainable livelihoods programme that has two main components:

1. Investment in resources to develop a hydroponics system at the Tobago Branch of the TTRCS, effectively expanding on the current hydroponics demonstration site established in 2020 as well as utilize sustainable climate sensitive approaches to traditional farming in the available land space surrounding the Tobago Branch.

2. The creation of an environment of learning to build a culture of change for youth to see farming as a viable career and educate persons on hydroponics systems. This includes training for both youth and adults in hydroponics, small-scale entrepreneurship

guidance, information on downscaling for home use.

## Objective

To improve the diversification of livelihoods and agriculture in the communities of Signal Hill, Patience Hill, and Lambeau, over the course of 5 months, utilizing climate-smart approaches, youth involvement, and training, to ensure community investment and intervention longevity.

## Activities carried out

- The TTRCS with the support of the IFRC CCD and Regional Office conducted an assessment of the livelihoods situation during a visit to Tobago in May 2022. The results of the assessment, which included the piloting of the NEAT+ environmental impact tool, justified the need for the development of hydroponics as the farming community in the targeted areas wanted to learn about alternate farming practices that could be implemented in the areas of Signal Hill, Patience Hill and Lambeau that did not have extensive farm lands. The community participation was also solidified through the involvement of the area representative for the Signal Hill/Patience Hill as well as the Tobago Agricultural Society which has committed technical support to ensure the hydroponics system is best utilized.
- The Tobago Branch remains in contact with the area representative's office as he has indicated that he will support the project by organizing training on Food Security for our community participants. It is anticipated to offer these sessions a week or two before crops are ready to be reaped from the hydroponic system.
- Multiple site visits completed by the contractor who will plough, rotavate and create planting beds to assess the feasibility of the heavy equipment operating in the space, the most recent site visit being December 16th, 2022. The weather was the limiting factor to have the land prepared before the end of 2022.
- Aggregate rock to create solid base for the hydroponics was delivered to site and later spread in the latter part of 2022. This was a critical component to be achieved before the framing for the hydroponic pipes could be installed.
- All eleven (11) Community Participants (CPs) were contacted and asked to join a WhatsApp group where they are receiving updates on our progress and when we hope to commence training.
- All CPs were asked to participate in our interviews but due to clashes in schedules, only four (4) were interviewed (we are hoping to have the rest of the participants interviewed when they begin working on the hydroponic system)
- The clearing of the heavy brush and trees around the perimeter of the compound has begun (this has been significantly hindered due to the rainfall).
- The hydroponics expert started installing the system on Tuesday 3rd January 2023 and significant progress has been made thus far. It is anticipated that by the week of 23rd January, the system construction would be complete and community training will begin. In this phase participants will learn the finer technical points such as how is set up the nutrient flows, measure chemical, take reading such as pH, and turbidity and basically all the steps in managing the system.

- An introductory session on hydroponic systems was completed on February 02<sup>nd</sup> 2023, with seven (7) participants in attendance.
  - The various types of systems, including the one that is based at the branch were explored.
  - Participants were given the opportunity to ask questions, and many did. The most popular question was what sort of system they should have at their homes, based on the space available (a few private consultations with the expert stemmed from this conversation).
- On February 09<sup>th</sup> 2023, a practical training session was completed with eight (8) participants, and they were also advised on how to plant the following seedlings in the system.
  - Curly Leaf Kale – 125
  - Eden Lettuce – 125
  - Joi Choi Pak Choi – 125
- On February 10<sup>th</sup> 2023, the hydroponics expert returned to explain the process through which chemicals should be measured, mixed and then fed to the system. This session was attended by two participants, as it was during the workday. Note that video recordings were taken and shared with the WhatsApp group that same day.
- On February 13<sup>th</sup>, 14 additional lettuce seedlings were planted to complete a pipe in a stand from the week before.
- The Community Liaison and Volunteer Engagement Officer completed three diagrams with the hydroponics expert's guidance, detailing how to operate the system based on the various processes that the system needs to go through such as
- Pre-Nutrient Mixing, Nutrient Mixing and Plant Feeding. These diagrams were shared to the WhatsApp group on February 14<sup>th</sup> 2023.
- A document with information concerning nutrient mixing was also prepared and shared to the group on February 14<sup>th</sup> 2023.
- On February 16<sup>th</sup> 2023, three hundred and seventy-five (375) seedlings were planted, for a total of seven hundred and sixty-four (764) plants planted across those two weeks.
  - Note as well that the system may hold different amounts of plants depending on the type of seedlings. In this case, because kale was planted, which tends to get rather large, it was necessary to space out the seedlings, thus taking up more space with less plants when compared to those pipes with lettuce and pak choi.





Figure 2. Participants transplanting Pak choi (09th February 2023).



Figure 4. Youngest of the group making holes for the seedlings (09th February 2023).



Figure 3. Participants preparing the Coco Peat and Red sand mixture for the pipes (09th February 2023)



Figure 5. Joi Choi Pak Choi at two weeks (transplanted into hydroponic system on February 9th 2023)



*Figure 6. Eden Lettuce at two weeks (transplanted into hydroponics system on February 9th 2023).*



*Figure 7. Curly Leaf Kale at two weeks (transplanted into hydroponic system February 09th 2023).*





*Figure 8. Red Lettuce at one week (transplanted into system February 16th 2023).*

## Results

- Eleven community participants have remained committed to working alongside the TTRCS on this project, learning about the system and supporting with its maintenance.
- Commitment from the Area Representative to provide additional training in food security
- Participants consulting with hydroponic experts for guidance on building their own systems at home
- Participants continue to show interest by doing checks on the system and plants, offering suggestions and advice
- Participants have a tangible product that they may be able to replicate or downsize according to their intentions. They also have access to diagrams and information that would assist in said replication.
- The area representative's office was invited to visit the system and they indicated that they would as soon as they are able.

## Scalability of the microproject

The community interest in this microproject suggests that there will be requests for support from participants to replicate the project in other communities once funding is available. The expansion of the system at the Tobago Branch is forecasted as a future project and an additional 1000 plant system can be accommodated at the Branch. This project also offers a unique opportunity to access community members, through the opportunities for future income that will be generated will directly support the implementation of additional projects.

## Lessons learned and recommendations

- People respond better to face to face interactions. This is not necessarily a new idea, but often, in this digital age, any reminder is welcome. It was especially applicable to the months-long search for community participants. A distinct difference was seen when the online form was circulated vs meeting random folks on the streets, at the supermarket, in the market, truly in some of the most random and unplanned situations, and asking them if they, or anyone they knew who would be interested in participating in the project.
- Longer implementation time-frame that considers delays due to unforeseen circumstances (unexpected bad weather, as it is the most significant hindrance to our progress)
- Funding released beginning of November, significantly delayed implementation.
- Scheduling a group of individuals will always result in some clashes. For the first session, which was essentially an introduction to hydroponics, participants who could not have attended in person should have been able to access the session virtually but there were technical difficulties. In hindsight, it would have been better to record the session.
- In line with what was previously mentioned, it was anticipated that after the first day of planting, most individuals would not have been able to attend the following session where training was done on mixing nutrients. This practical session was recorded and shared in the WhatsApp group, easily accessible to all.
- Plants, especially in their early stages of growth are susceptible to many pests and diseases.
  - Daily observation may be the difference between total failure and resounding success (we caught on in the early stages by observing some of our pak choi and kale plants that the PH level of the water was too high, this usually results in yellowing of the leaves). Unfortunately we also noticed that in addition to yellowing leaves, some of the pak choi were infested with Aphids.
  - Some organic suggestions for the infestation were provided by participants as well as the hydroponics expert and the issue will be dealt with as soon as possible.



Figure 9. Yellowing Kale Leaves (February 22nd, 2023).



Aphids

Hatched Aphid  
eggs

Figure 10. Yellowing Pak choi leaves and Aphids attached to the underside of one leaf. White flecks at the base of the plant are the hatched eggs of the aphids (February 23<sup>rd</sup>, 2023).



**Update of implementation schedule**

Note that all materials and services were procured by December 22nd 2022. While attempts were made to have the hydroponics system installed, and the land prepared for the traditional farming at the Branch compound, the inclement weather hindered all major progress.

The system was completed in time for transplanting to be started on February 9<sup>th</sup> 2023. Further training and planting have continued since then.

Activity	November '22				December '22				January '23				February '23			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Delivery of aggregate materials																
Delivery of hardware materials for hydroponics																
Preparation of land																
Installing ground cover																
Installing hydroponic system																
Community Participants' Training Sessions																



Contact information responsible for the project

**Name: Stephan Kishore**

**Position: Crisis Management Coordinator**

**Mail: [stephan.kishore@trcs.org](mailto:stephan.kishore@trcs.org)**