SAINT LUCIA

CONSTRUCTION OF HOOP GREENHOUSES IN RESPONSE TO HEAVY RAINS AND FLOODS

Presenter

The Saint Lucia Marketing Board, Grace Farmer's Association, Belle View Farmer's Association, Black Bay Farmer's Association

Description

In the context of Saint Lucia, the most prevalent effects of the climate change include severe drought conditions and severe flooding conditions. These effects always affect farmers and farming practices. Short-term crops can be wiped out and strong winds often break off the branches of more established fruit trees. These strong winds are associated with the increased frequency and intensity of hurricanes during the hurricane season. In an area with undulating terrain like Saint Lucia, it is very easy to lose the top layer of soil in this way. When the top layer erodes, it is very likely that landslides and road blockages will occur, leading to clogged drains, flooding and impassable roads. Crop loss affects farmers' harvest yields and their profits. Each farmer therefore has to bear his own losses, causing the cost of production to be higher.

To protect against the effects of more frequent heavy rainfall, the Taiwan Technical Mission has constructed hoop greenhouses across the island. These hoop green houses will assist in protecting the short-term crops from wind and rain damage that can harm the leaves and also the plants' ability to photosynthesize. They also reduce the effects of rain, which causes premature loss of plant flowers, thus preventing the plants from producing fruit. During heavy rains, the growing crops can be covered so that the losses are minimized. In addition to this, different crop varieties are grown to determine how they fare in the local rainy season and the dry season. Some of the varieties have a shorter growing cycle, which means they have a faster turnover, other varieties have a higher tolerance to heat and stress conditions. Finally, some varieties of watermelon have a thicker skin that prevents them from splitting easily. All of these measures ensures that the farmers have higher marketable yields.

Lastly, three sets of weather stations have also been installed in different parts of the island, an instrument that uses internal sensors to determine and record the weather and make it available digitally via a laptop computer. The data provided by the weather stations will help farmers make more informed decisions about growing their crops and minimise losses due to changing conditions. So far, it has been possible to successfully prevent crops from being damaged by pests and diseases using weather station data analysis.

Also, during COVID-19, the project facilitated collaboration between various actors in the food value chain. A partnership was initiated with the main supermarket in St Lucia to give farmers the opportunity to sell their products and present the new varieties to the public. This was done through trials and tastings of fresh products over several months. In addition, the farmers were put in touch with the National Marketing Board to provide it with supplies for several months, which ensures a market for the farmers during the COVID-19 pandemic

Results

In terms of agricultural yield, these are the results obtained: farmers observed that the hoop greenhouse has had a higher yield and sweeter fruits. The damage ratio of short-term crops can drop by 25 to 30 percentage. This is because the retention properties of the flowers during heavy rains and the heat generated in some cases keep the level of pest and other insect attack very low. The hoop greenhouses are also quite helpful in protecting the fruits during heavy rains and prevent them from splitting in some cases.

In terms of economic benefits: farmers can achieve a much higher commercial yield and, as a result, earn more than they would have done without the new varieties. The best estimate shows that farmers could increase their income by up to 1.9 times more than before. In addition, the types of varieties chosen also help the farmer to stagger planting and produce a variety of crops for a wider range of customers/markets by expanding sales channels. Research shows that farmers could increase their income by up to 20% compared to before.

In terms of the environmental benefits: the hoop greenhouses enable the slow filtration of rainwater and minimise topsoil runoff, in combination with the additional use of permeable plant cover. By doing so, the soil biodiversity is protected. About 600 farmers are benefitted from the implementation of this practice.
As a result, the efficiency of production/distribution chains in Saint Lucia has improved and imports have decreased. Through planned production, watermelons, melons, cantaloupes, peppers, tomatoes, lettuce and cabbage are flourishing. These crops are the most imported crops on the island of Saint Lucia that farmers traditionally grow and the aim is to enhance self-sufficiency and food security in the near future. In addition to this, the hoop greenhouses allow for greater resistance against the damaging effects of soil erosion, the fall of flowers and the loss of fruits and vegetables due to cracks and splits; the fruits are better protected until harvesting. The other aspect of the project includes a marketing component that enables farmers and farming communities to maintain their primary means of income and livelihood.

Climate smartness

This story is a clearer example of the adaptation and mitigation strategies that can be implemented to strive to ensure food security when joint and coordinated efforts from different stakeholders have a common purpose. Maintaining or increasing crop yields directly benefits farmers´ income, as is well described above. Likewise, an important aspect that increases household and farm resilience capacity, is the short- to long-term benefit of these practices in preserving or improving the environment and ecosystems services —in relation to sustainable management of soil, water and biodiversity— that enable the adequate conditions for farmers to carry out their agricultural activities successfully. Therefore, some spillover effects on mitigation can be outlined in the avoided crop losses and soil erosion or degradation, in both cases the carbon and even the water footprint can be reduced when available productive resources are used efficiently and sustainably, hence maximizing farm productivity. It is also worth mentioning that associativity and cooperation unlock common barriers to implementing climate-smart practices when, for example, in the case of hoop greenhouses could be a practice that cannot be afford by small-scale farmers limiting their implementation and reducing their capacity to withstand to climate-related hazards. In the same vein, education, and technical, financial and agroclimatic services should be integrated in broader regional adaptation and mitigation plans supported by participatory decision-making processes that can better integrate agriculture and climate change in the design of national policies.