



# Enhancing Hydroponics System in Senara's Farm

## Case Study

July 2022



## KEY HIGHLIGHTS

### Sustainable Hydroponics Farm, Utilizing Senara's Social Innovation & Flowless Smart Optimization Solutions

In this case study, we demonstrate how Flowless smart solutions help in optimizing hydroponics system to make it more efficient and productive.

- Real-time data collection to measure nutrients concentration in the hydroponics system
- Automating the process to control nutrients dosing & pumping
- Early alarm system for more adaptive operations and improved water efficiency





## WHAT IS HYDROPONICS?

Hydroponic farming is a method of growing plants using mineral nutrient solutions in water medium without soil. The hydroponics farm owner controls the growing environment of the plants by adding nutrients and controlling water pumping into the system. Both water and nutrients are fed directly to plants' root and recirculated in a closed loop. This also eliminates the typical land and water pollution potential due to overland flow and runoff.

Plants need food, water, and air. When you break it down to those three things, it becomes simple to give plants only what they need. Hydroponics is the science of growing plants without soil. Plants thrive on the nutrient solution alone; the medium merely acts as a support for the plants and their root systems.



# HYDROPONICS FOR HEALTHY & PRODUCTIVE YIELD

Good nutrition and water conditions are essential in a hydroponics system. Farmers add nutrients in hydroponics farms based on regular measurements of their concentration in water to target the right amount. Here is the formula: get the nutrients concentration right and magic will happen!

Hydroponics system enables farmers to grow their plants anywhere and in any environment. The system operates in a controlled environment where lighting, ventilation, and temperature are all controlled to provide the optimal environment for the crops. This means that you can grow your vegetables or plants in your office, balcony, or rooftop.

Hydroponics system is often seen as a practical and feasible way of modern farming on small systems or at a large scale.

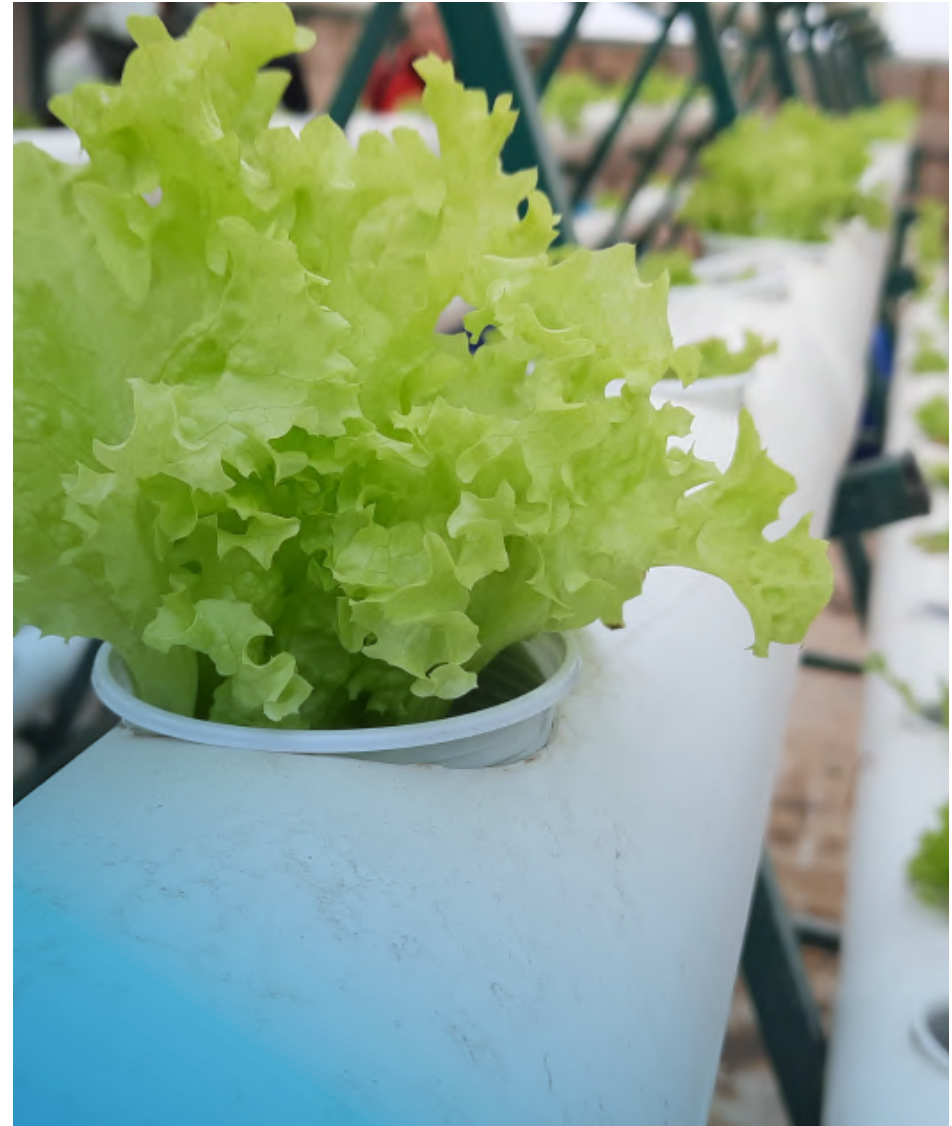


# Senara Hydroponics Farm

## Brief Overview

Food security is currently being challenged like never before, urging farmers worldwide to improve their farming practices to adapt and build resilience. Senara, our partner from Jordan, is disrupting traditional farming in the heart of the crisis, building on the very little resources they have in refugee camps to provide sustainable income for marginalized communities through rooftops hydroponics.

Sounds cool, right? Inspired by Senara's innovative business model and their grassroots initiatives, Flowless joined forces to grow and accelerate the positive impact. We're working with Senara on our combined smart hydroponic system, which would help in delivering the sustainable agriculture approach to more farm owners and greatly enhance their feasibility and productivity.





# Flowless helps in automating Senara's hydroponics farm & optimizes operations through a data-driven approach



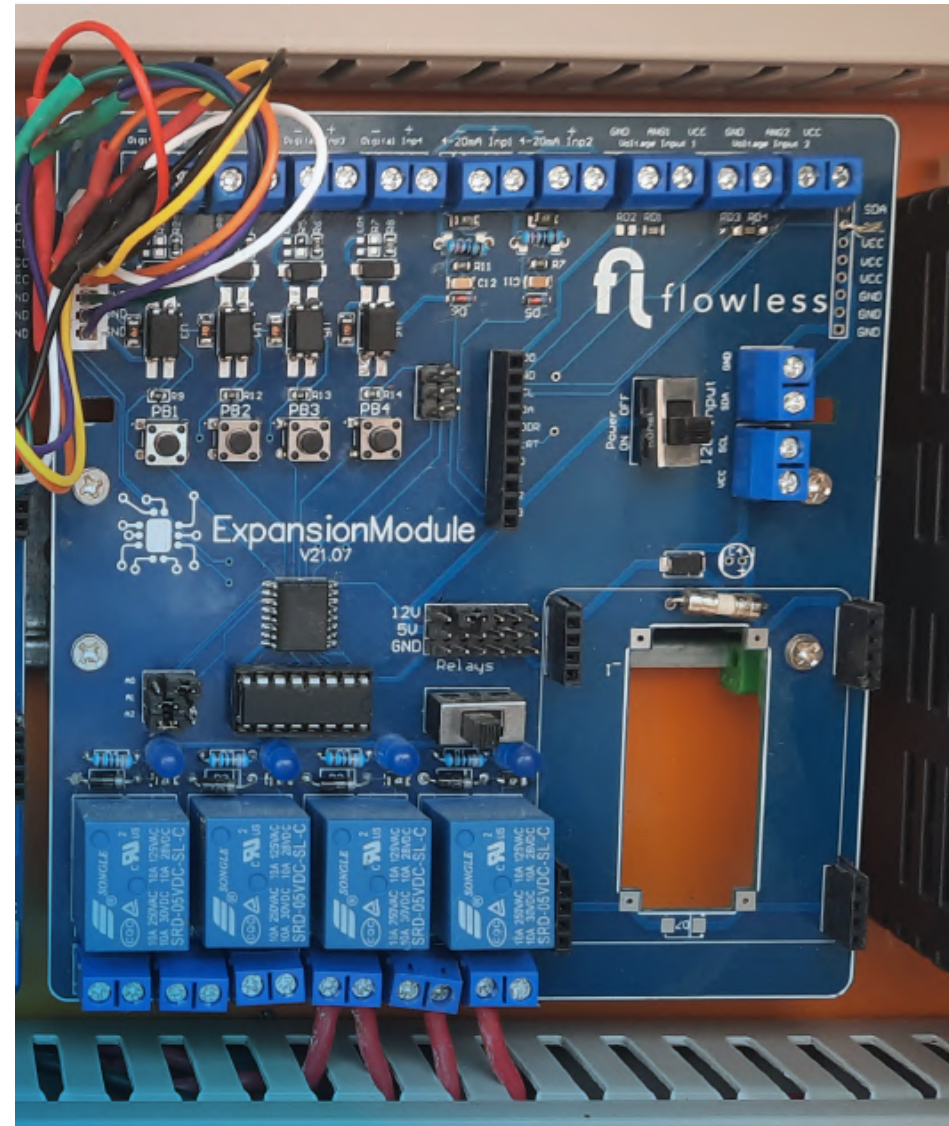


# HOW FLOWLESS WORKS

## Our Approach and System Design

Flowless integrates emerging technology, innovative financing, and social responsibility to support farmers in enhancing water use efficiency. Flowless system utilizes IoT and AI technologies to optimize operations and automate processes in the farm. It starts with collecting real-time data from the field, then analyzes it and provides robust tools for precision irrigation and process optimization, ultimately contributing to reducing water consumption and enhancing agriculture yield.

Flowless aims to support local farmers and agri-businesses in leveraging sustainable resource utilization. Our is designed to serve the needs of farmers and agribusinesses while generating positive impact and building communities' resilience and welfare.





## HOW FLOWLESS SYSTEM HELPS SENARA'S FARM?

- Improved water efficiency: hydroponics consumes less water than traditional farming systems
- Automated operations: Flowless system automatically performs all operations on the farm
- Process optimization: Controlling nutrient mixing and dosing based on real-time data
- Enhancing the yield and improving productivity
- Reducing the operational costs and efforts



## USING SMART TECHNOLOGY TO CONTROL THE HYDROPONICS FARM

In many cases, inexperienced farmers struggle with optimizing their hydroponics farm in their early stages. Nutrients mixing and dosing concentration are sensitive; you need to get them right for the system to work properly. More experienced farmers might still have issues with the agriculture produce due to mistakes in managing water and nutrients pumping.

Innovative farming technologies have the potential to improve food security. Hydroponics is a great example on how these technologies can help in communities' resilience.

Flowless system helps in collecting data, monitoring, and measuring these concentrations and the ambient environmental conditions. Based on this collected data, the system automatically pumps the nutrients into the water pipes. This facilitates controlling the hydroponic farm much easier and saves time and effort.







## COLLECTIVE SOCIAL IMPACT

If there is one takeaway from our collaboration with Senara, then that would be how social enterprises can maximize their impact through partnerships! Senara empowers refugees by helping them generate more sustainable income through rooftop gardens, ultimately contributing to building resilience and financial stability for marginalized communities.

The twinning between impact generation and financial returns is organic in Senara's business model, as is the case for Flowless. Thus, the integration between Senara's hydroponics and Flowless automation system was just natural, building on the common vision and values to materialize the social impact. Flowless system helps in automating and optimizing the operations in Senara's rooftop hydroponics, and thus ensures better yield and productivity of the rooftop garden.



Interested in contributing to  
Flowless impact? Drop us an  
email!

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Thank you!

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