

# GOHYDRO



## **A SMART-SENSING AI-DRIVEN PLATFORM FOR SCALABLE, LOW-COST HYDROPONIC UNITS**

The main motivation for the GOHYDRO project is the optimization of the cultivation process that will allow the harvest of the best possible products in any hydroponic installation including low-cost, consumer-grade equipment. To achieve this, a cost-efficient smart-sensing ICT platform capable of monitoring the crops' health and nutrient content of hydroponically cultivated microgreens will be developed. The platform will integrate different sensor kits for nutrient, plant health and environment monitoring for indoor production of various microgreens. The main output of the project will be an e-agronomist for hydroponic growers, helping them to make informed decisions for the production of high yields of nutrient-dense microgreens.

# BACKGROUND

One of the biggest challenges of humanity in the 21st century is to devise sustainable solutions to produce more food while minimizing environmental impact. Hydroponics has emerged as one such solution, as it requires no arable land, reduces the usage of clean water and can be used in any urban setting. Within this framework, GOHYDRO aims at developing a cost-efficient smart-sensing ICT platform capable of monitoring the crops' health and nutrient content of hydroponically cultivated microgreens in order to optimize the cultivation process and allow the harvest of the best possible products.

GOHYDRO aspires to culminate in the production of a platform that will be a shifting paradigm of how AI-driven technological innovation can become an affordable, accessible-by-all tool applicable to all forms of urban farming. In a nutshell, the proposal aims at creating a form of an easy-to-use e-agronomist which will assist any grower to fine-tune and optimize her hydroponic production.

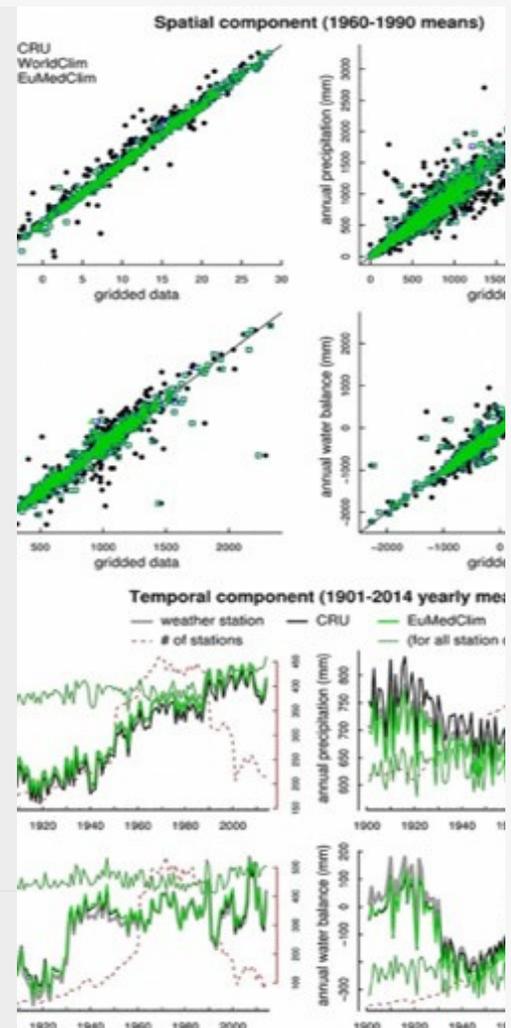
## MAIN PROJECT ACTIVITIES

GOHYDRO platform will be based on the merging of two innovative tools:

- a new type of fully-immersible, microfluidic-free silicon photonic probes capable of effortless on-the-spot spectral recording of microgreen pulps and
- an artificial intelligence (AI) component implementing a multi-model approach that will produce accurate predictions and recommendations with limited amounts of data.

The main project activities can be summarised as follows:

- Thorough review and analysis of the factors that affect microgreens growth and nutrient quality, in terms of nutritional and environmental requirements as well as lighting needs of the plants.
- Selection of sundry sensing devices to be included in the platform as a Multi-modal sensor kit, and the subsequent definition of multiple climate recipes, i.e. environmental and nutrient configurations to be checked for optimising the cultivation of microgreens.
- Evaluation cycles of incremental proximity to the realistic usage of the platform, i.e., as a stand-alone hydroponic unit installable in everyday settings and requiring no expertise to be managed and configured.



# EXPECTED SOCIAL IMPACT

The societal benefits of the project outputs are adding value to the living spaces and working environments with plants for healthy eating habits, profitable and aesthetically pleasing exploitation of vacant spaces and abandoned buildings in the city. In addition, the system can be also used as a demonstrator farm in schools and kindergartens promoting sustainable solutions for the new generations, in community farms for elders and close-knit communities sharing kitchen and other living spaces, as a teaching platform to promote microgreens as an essential element of healthy dietary habits and hydroponics as a new “currency” for quality of life in urban settings, or even as a teaching platform in disaster areas and refugee camps for food production.

## Keywords

- Microgreens
- Urban farming
- Smart sensors
- Data-driven platform
- Hydroponic units
- Machine learning

## Duration

01/03/2021 - 28/02/2023

## TRL

Technology Readiness Level 7

## Consortium

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### Partners

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