

Introduction

Hydroponics have emerged as a viable solution to one of the biggest challenges of humanity in the 21st century: to devise sustainable food production paradigms with minimized environmental impact.

For the evolution and democratization of hydroponic cultivation, **GOhydro proposes a low-cost, DIY hydroponic unit, equipped with different sensors for monitoring the cultivation and empowered by tailored AI technologies for optimising plant growth.**

GOhydro builds on thoroughly researched and rigorously tested “climate recipes” to identify the ideal conditions for growing and exploits sensing and analytics technologies to continuously control the state of the plants in the hydroponic unit and propose mitigative actions.

The real value comes from the informed analysis of the collected data and the provision of clear guidelines for the growers to treat their cultivation via the GOhydro mobile app.



Consortium Partners

- ❑ SCiO [Greece] – **Coordinator** – www.scio.systems
- ❑ Institute of Nanoscience and Nanotechnology, National Centre for Scientific Research “Demokritos” [Greece]
- ❑ Department of Plant and Environmental Sciences, University of Copenhagen [Denmark]
- ❑ Nr21 Design [Germany]
- ❑ Holisun SRL [Romania]
- ❑ University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca [Romania]

Research Approach

- **Review and analysis** of the factors that affect microgreens growth and nutrient quality.
- Identification of optimised cultivation “**recipes**” (cultivation conditions).
- **Correlation** of factors with measurable variables.
- **Sensor selection** and sensor kit design and app development.
- Development of **predictive AI** operating over limited data volumes.
- **Evaluation cycles** (in Greece, Denmark and Romania) of incremental proximity to realistic platform usage.

Major Results

- Formulation of **climate recipes**, i.e., instructions for optimising cultivation and coming up with sufficient and nutritional yield.
- Development of the **GOhydro Sensor Kit** that incorporates sensors into a single custom-designed enclosure kit compatible with **common 3D printing technology** and freely available as open hardware.
- **Trained AI models** associating sensing measurements with yield and quality, over data acquired via the pilots.
- Incorporation of the AI models in the **GOhydro data platform** and connection with the **GOhydro mobile app** to provide guidelines for the growers to treat their cultivation.

Conclusions

- ✓ **The process** for designing the GOhydro platform, namely the GOhydro Sensor kit along with the GOhydro mobile app followed a scientifically and technically solid methodology.
- ✓ **The core final products**, namely the GOhydro Sensor kit and the GOhydro mobile app, have strong business potential.
- ✓ **Training the AI models** incorporated within the GOhydro mobile app would require additional evaluation cycles for optimizing their predictive accuracy due to the complexity of the crops’ growth optimization problem.