HydroHelp

Polytechnic University of Timisoara

Presented by Careba Cristian

Introduction

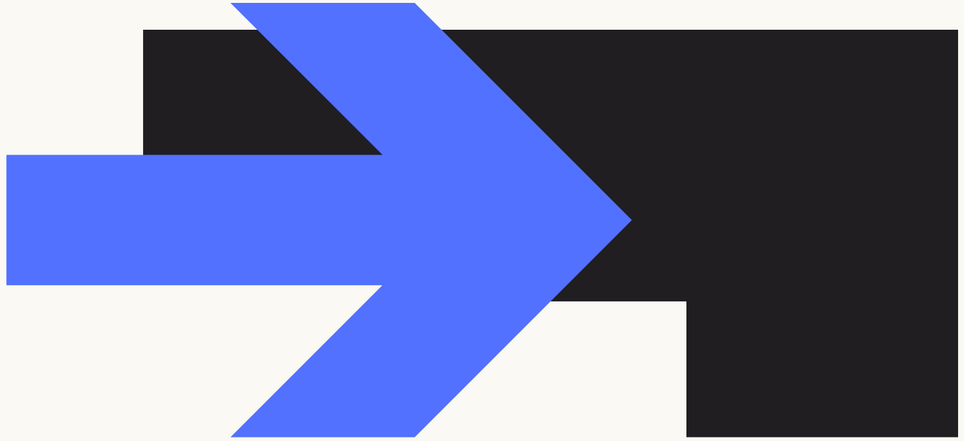
What is it?

HydroHelp is a smart irrigation controller designed to assist small to medium-scale farmers in optimizing water usage.

How does it help?

The system uses real-time weather data, soil moisture sensors, and AI to determine the most efficient irrigation schedule, aiming to conserve water while maintaining crop health.

Mission



Goal

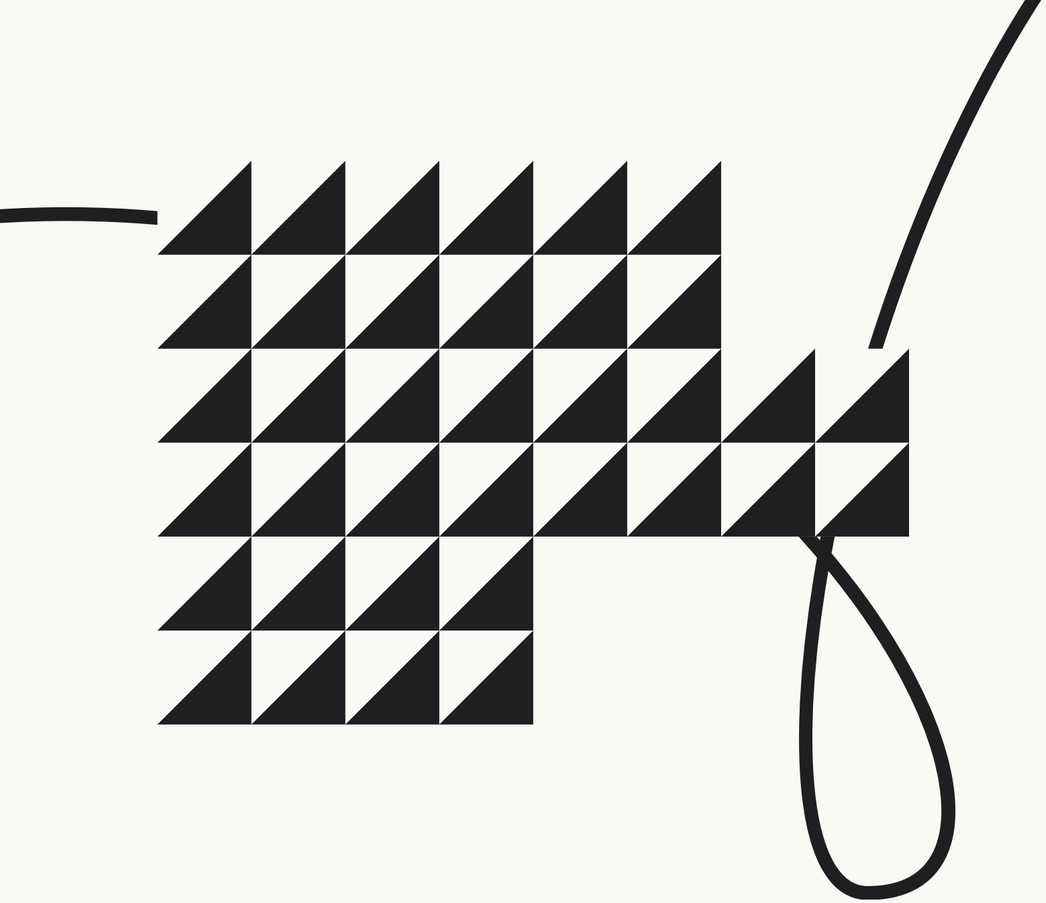
To provide an accessible, cost-effective solution for farmers to optimize their irrigation practices, reduce water wastage, and increase crop yield.

Vision

Envision a world where all farmers can utilize technology to sustainably manage water resources, ensuring food security and environmental preservation.

Hypothesis

Implementing a smart irrigation system that integrates real-time weather data and soil moisture levels can significantly reduce water usage without compromising crop yield.



Literature review

Current Irrigation Practices

Traditional irrigation methods like flood irrigation are prevalent due to their simplicity. However, these methods are criticized for their high water consumption and low efficiency, which can lead to significant runoff and evaporation

---

Technological Innovations in Agriculture

The integration of advanced technologies such as and AI in agriculture has led to the development of smart irrigation systems. These systems are capable of adjusting water delivery based on soil moisture content and weather predictions, improving water use efficiency

---

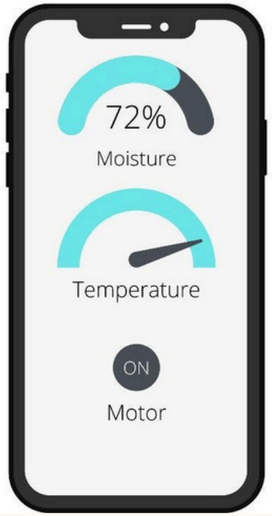
Rainwater Harvesting

AI enhances irrigation by enabling precise control and monitoring, optimizing water usage for varying weather conditions and soil types. Real-time data from sensors ensures that irrigation is responsive to the immediate needs of crops, thereby conserving water and improving crop yields

Data collection

- Methods:
  - Installation of soil moisture sensors in various fields to gather data on moisture levels.
  - Use of local weather stations to integrate real-time weather information.

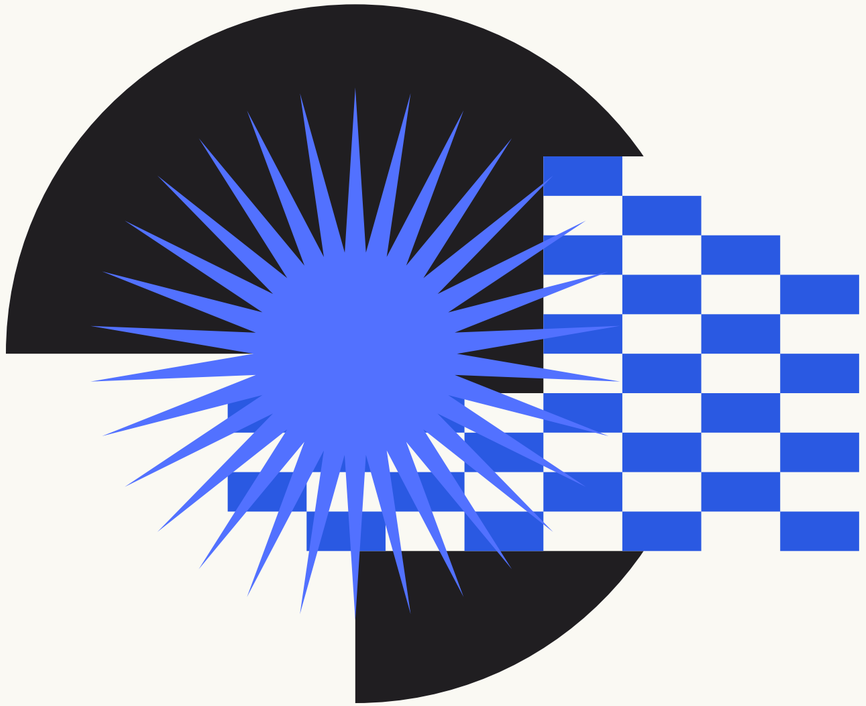
- Participants:
  Work with a group of volunteer farmers across different climatic regions to implement the system and gather diverse data.



Energy Efficiency

- **Water Efficiency:** Implementation of smart irrigation resulted in up to 50% reduction in water use, showcasing significant improvements in water management efficiency across various test sites.
- **Crop Yields:** There was a noticeable increase in crop yields, attributed to more precise and efficient water and nutrient delivery directly to plant root zones.
- **Farmer Feedback:** Overall, farmers expressed satisfaction with the systems, noting benefits such as reduced labor and operational costs, and enhanced control over irrigation processes.

Conclusion



01

Key Findings

The deployment of smart irrigation systems enhanced both water use efficiency and crop yields, demonstrating the systems' effectiveness in meeting crop needs while conserving water.

02

Future Outlook

The findings suggest potential for broader application of smart irrigation technologies in addressing global water scarcity issues in agriculture. Further development and wider adoption could promote more sustainable farming practices worldwide.

03

Recommendations

Future initiatives should focus on integrating advanced AI and expanding sensor networks to optimize irrigation further. Policies encouraging the adoption of smart irrigation technologies could accelerate shifts towards sustainable agricultural methods.

References

https://news.mit.edu/2023/gear-lab-creates-affordable-user-driven-smart-irrigation-controller-1025

https://theagrotechdaily.com/smart-irrigation-systems/

https://www.mdpi.com/2073-4395/13/8/2113