

ECOROVER

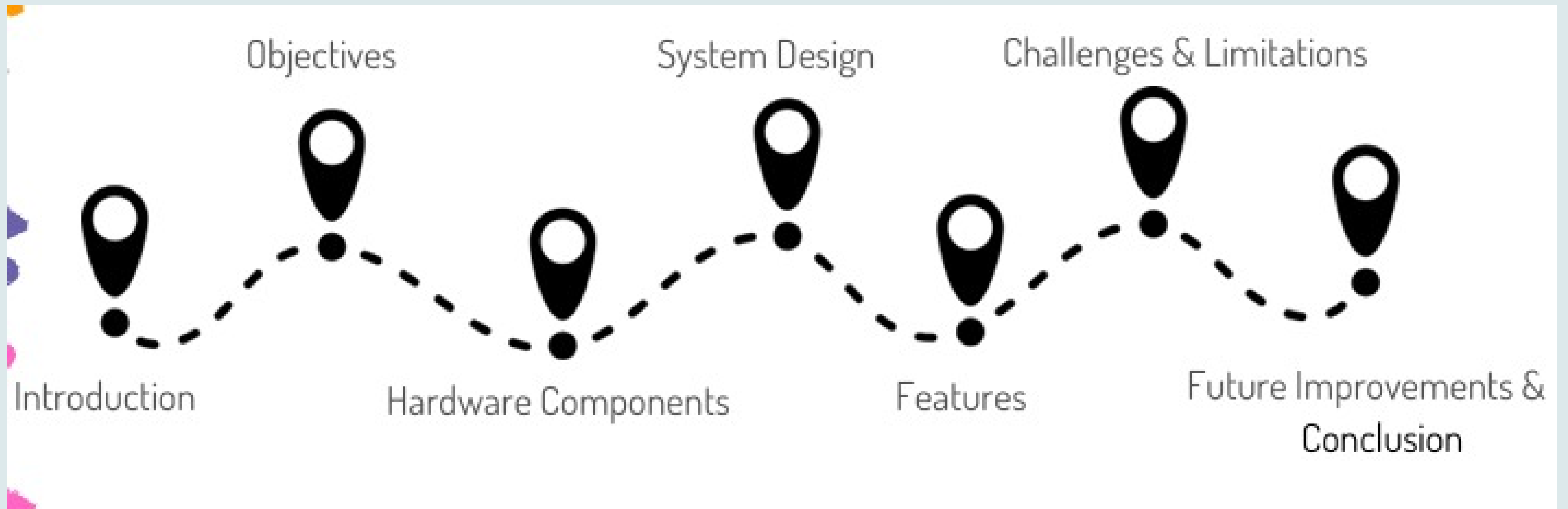


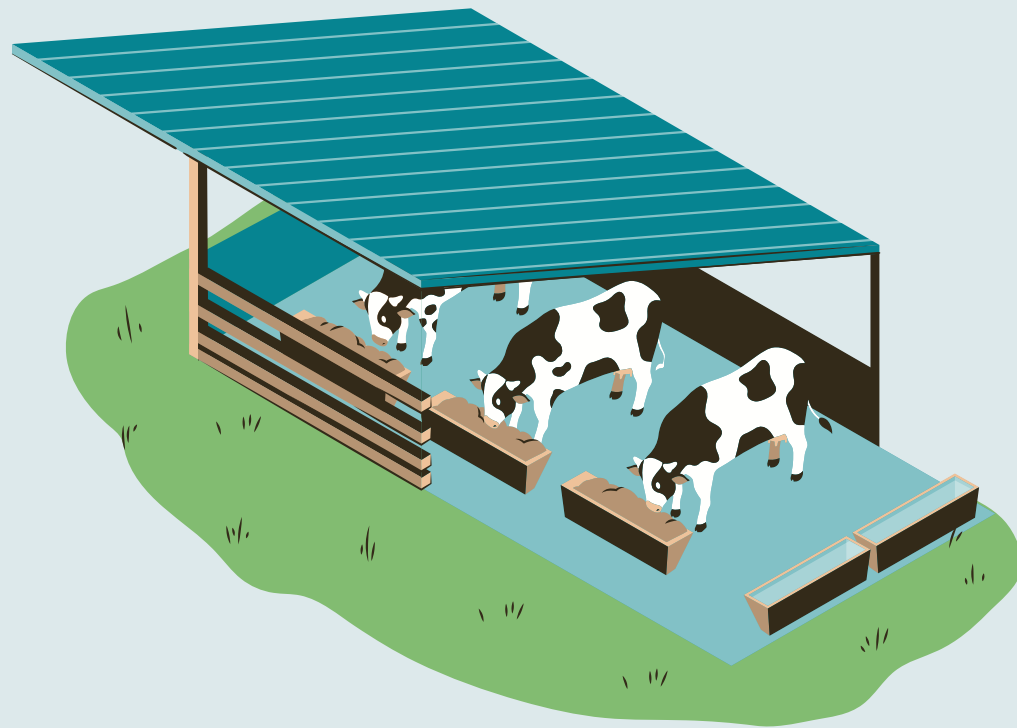
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ASAAD DWIKAT



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INTRODUCTION

Problem:

Traditional farming relies heavily on manual labor and inefficient irrigation, which leads to increased costs and inconsistent crop quality.

Solution:

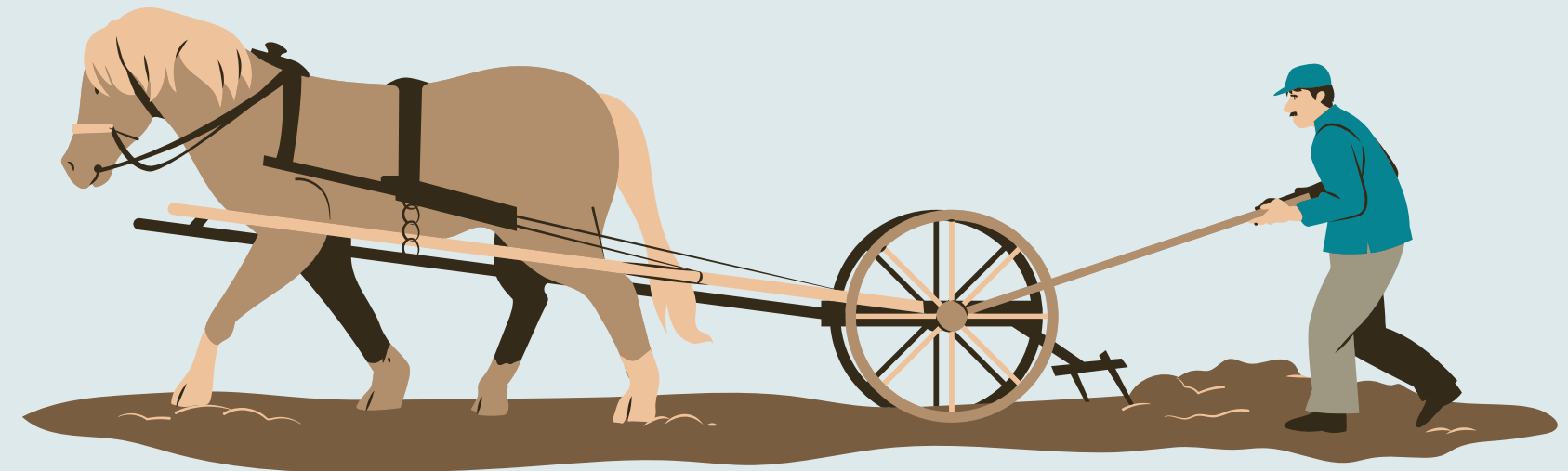
A smart agricultural robot that performs automated plowing, seed planting, and soil moisture–based irrigation using sensor data and an ESP32 controller.

Purpose:

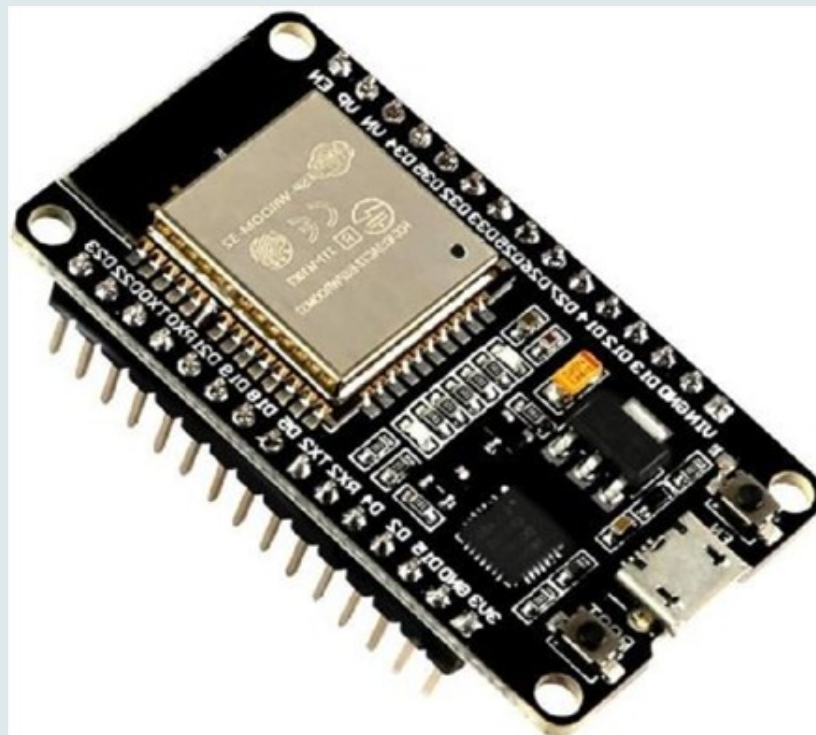
To improve agricultural productivity, reduce operational costs, and optimize water usage through intelligent automation and easy local web-based control.

OBJECTIVE

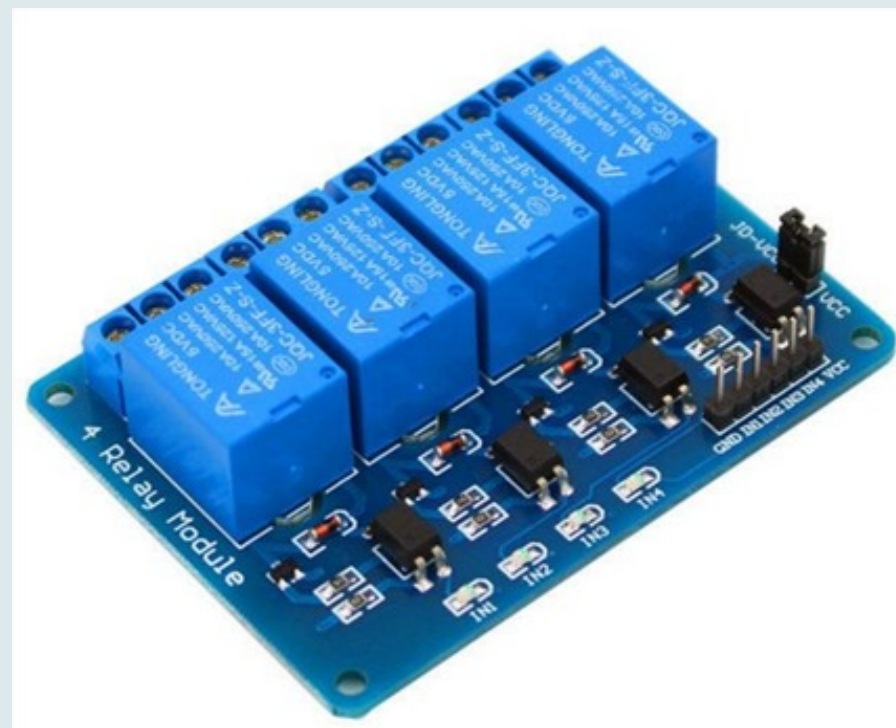
1. develop a smart agricultural robot that automates basic farming tasks such as plowing, planting, and irrigation.
2. sensors to monitor soil conditions and control water usage automatically.
3. controlled through a local web server using an ESP32 for easy and reliable operation.
4. helps reduce manual labor and improve efficiency and crop.



HARDWARE SYSTEM COMPONENTS



ESP32 MICROCONTROLLER



RELAY 4 CHANNEL



12V BATTERY PACK 7000MAH



MG996R SERVO MOTOR



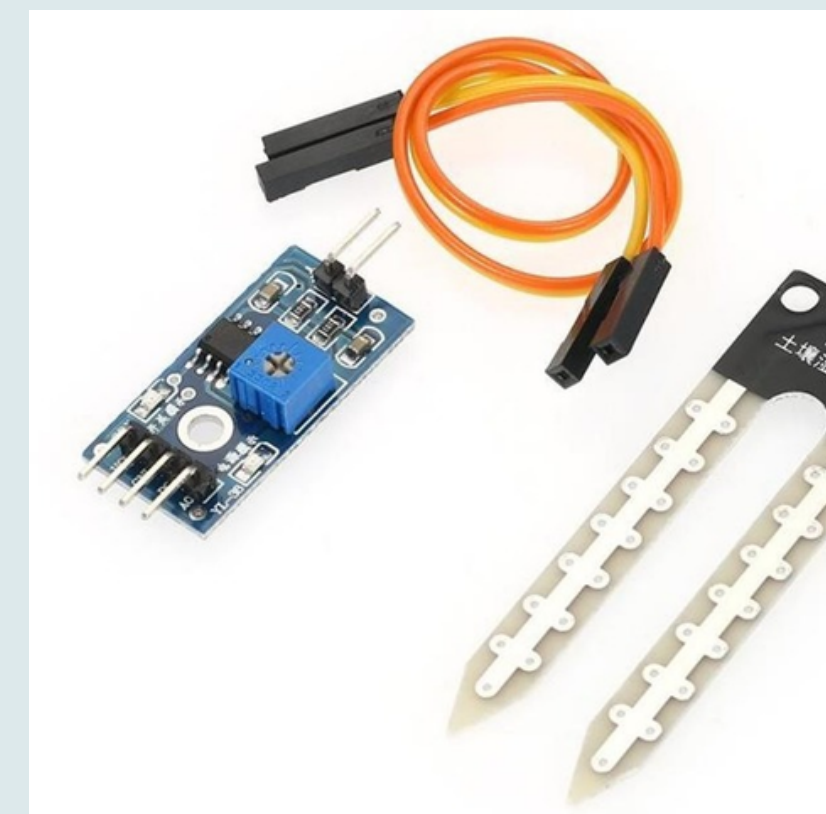
WHEEL DC MOTOR



CONVERTER BOARD PCB XY-3606



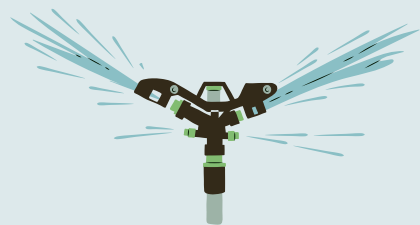
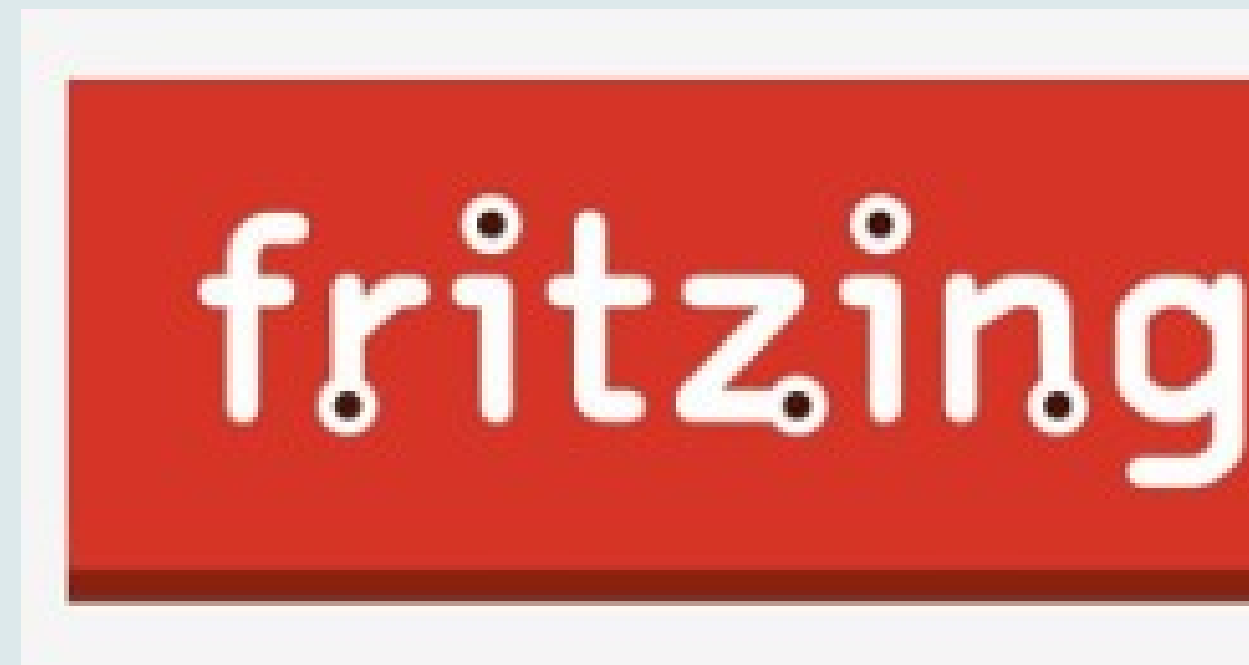
MOTOR DOSING LIQUID WATER SQUEEZE



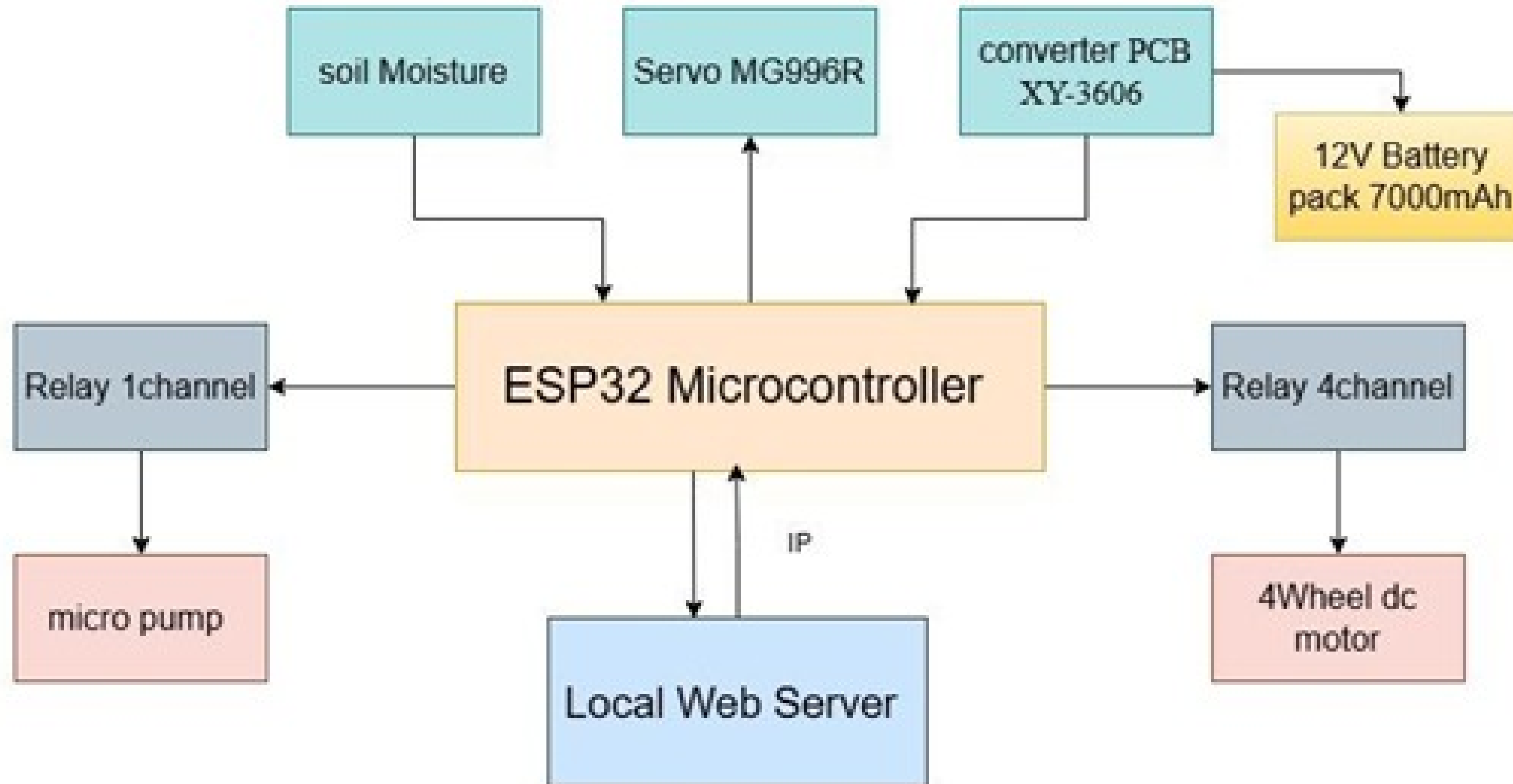
SOIL MOISTURE HYGROMETER

SYSTEM SOFTWARE COMPONENT >

 LICERIA & CO.



Block diagram Smart agricultural robot



FEATURES



1

PLOWING SYSTEM (PLOW)



The plowing system is used to till and loosen the soil in order to prepare it for planting. It is controlled using a servo motor that raises and lowers the plow as needed



2

IRRIGATION SYSTEM



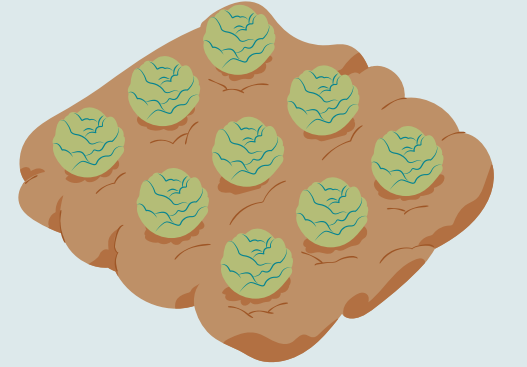
The irrigation system activates the water pump when the soil moisture level drops below a predefined threshold. This helps maintain proper soil moisture and prevents crops from drying out.





3

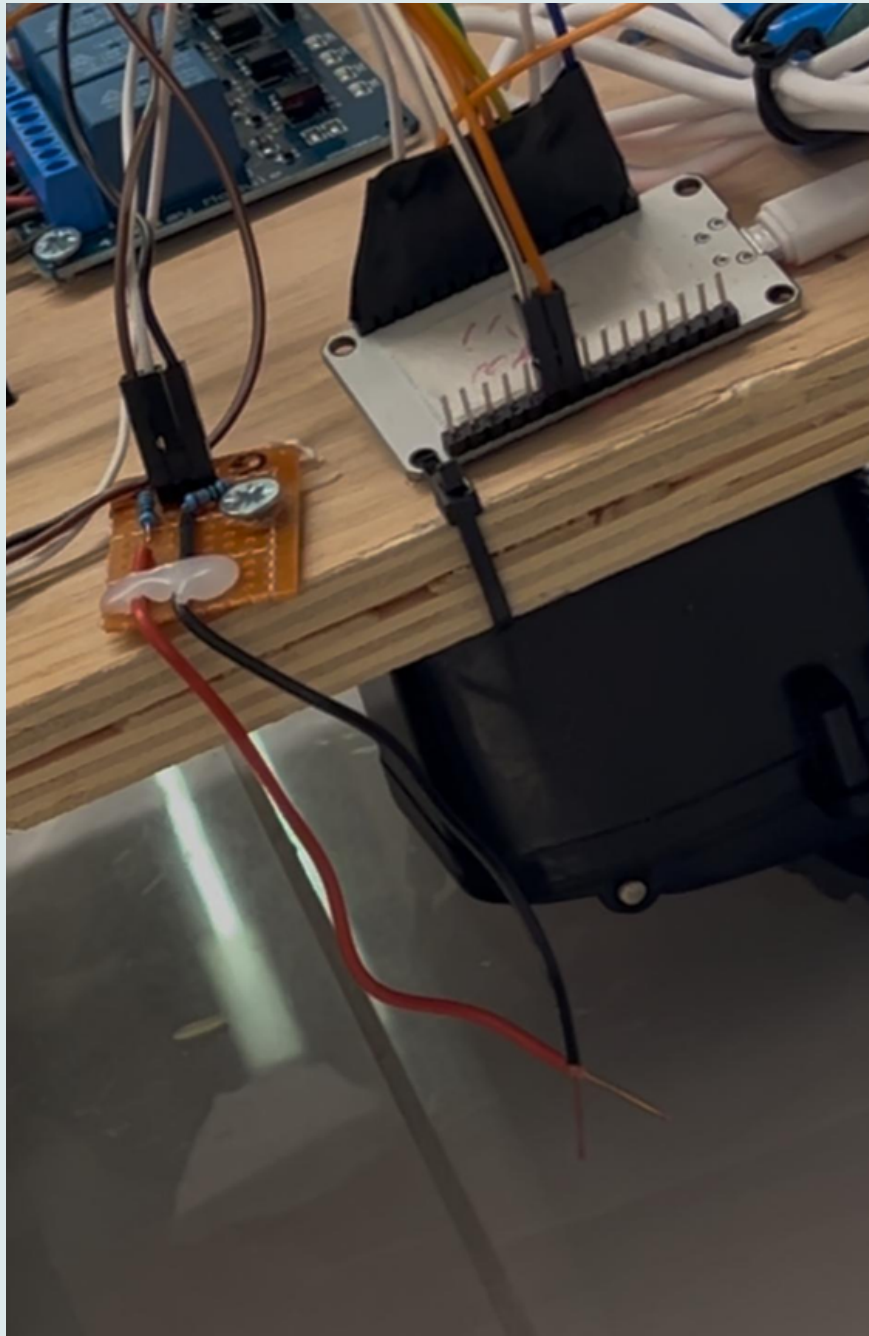
SEED PLANTING SYSTEM



This system automatically plants seeds in the soil while the robot is moving. It ensures accurate and uniform seed distribution to improve crop growth

4

SOIL MOISTURE SENSOR



The soil moisture sensor continuously measures the water level in the soil. The sensor sends data to the controller to determine whether irrigation is required.



LOCAL WEB SERVER CONTROL >



Smart Agricultural Robot

Move

Front

Stop

Back

Left

Right

Seed

Open

Close

Plowshare

Up

Down

Pump

On

Off

Auto

Cancel

Seed

Open

Close

Plowshare

Up

Down

Pump

On

Off

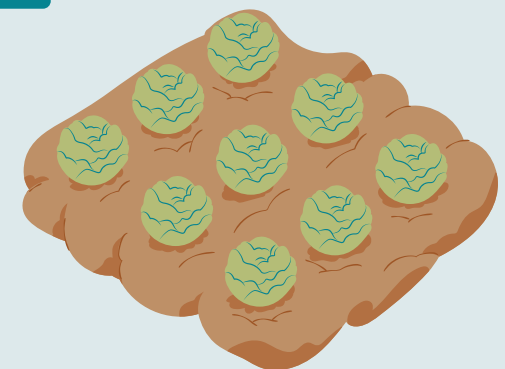
Auto

Cancel

Item	Status
 Moisture	0%
 Pump	Off
 Pump Status	Manual
 Wheel	stop
 Seed	close
 Plowshare	stop

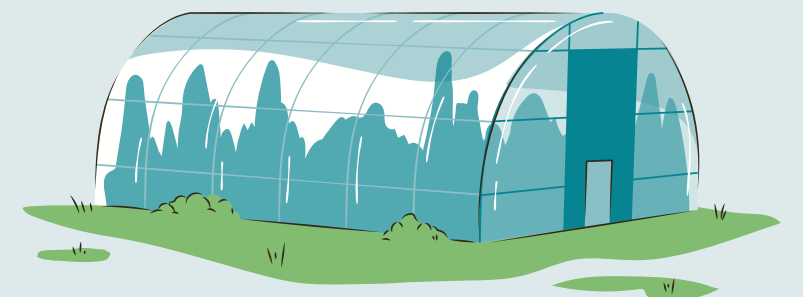
CONCLUSION

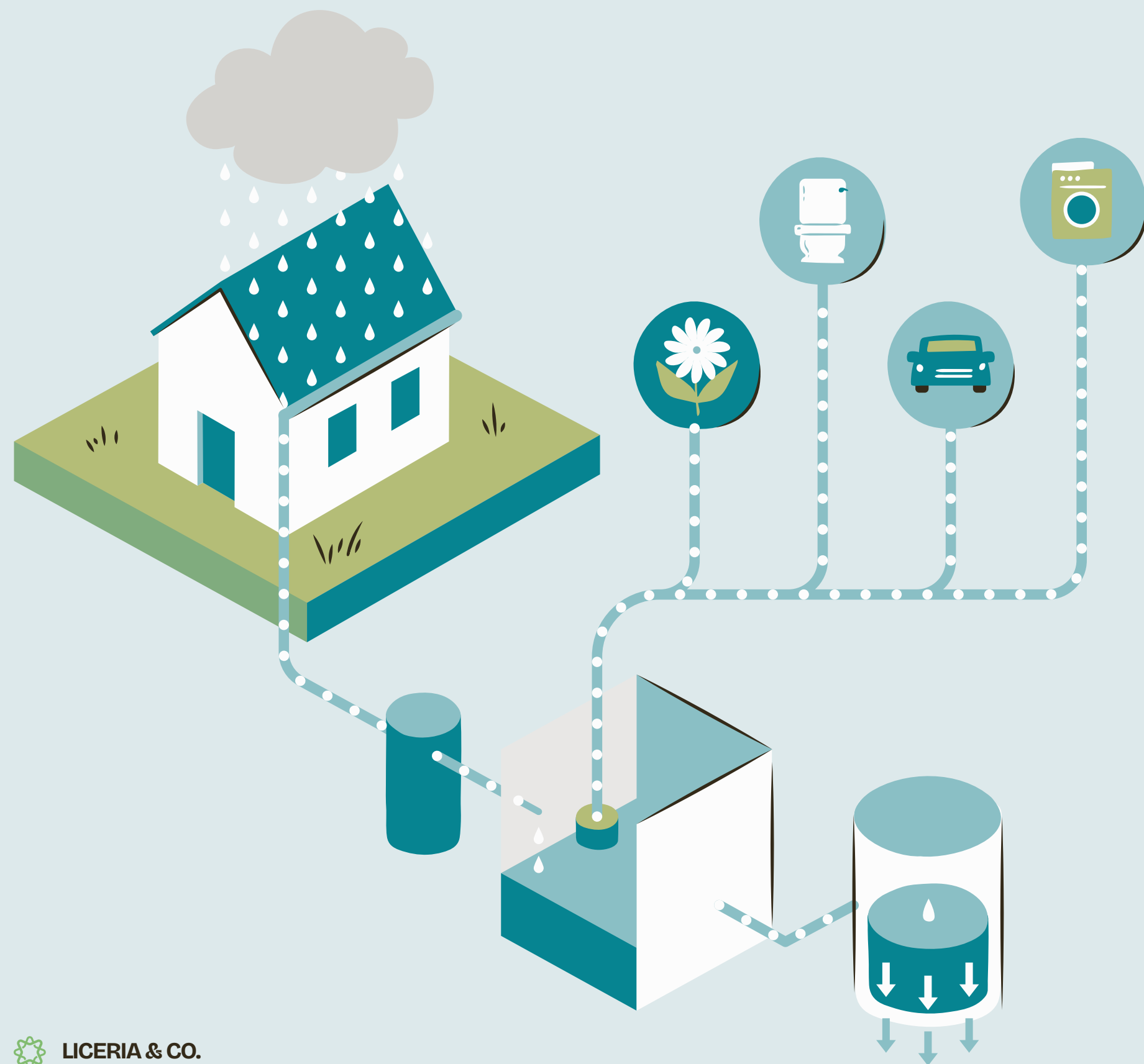
The smart agricultural robot was successfully designed and implemented to automate key farming tasks such as plowing, seed planting, and irrigation. The system uses sensors to monitor soil moisture and activate watering automatically when needed. Using an ESP32-based local web server allows easy and reliable control without requiring an internet connection. Overall, the project reduces manual labor, optimizes water usage, and provides a cost-effective solution for smart and sustainable agriculture.



RECOMMENDATIONS . >

- 1) improve mechanical design for uneven ground and different soil types to enhance stability and reliability.
- 2) Add environmental sensors (temperature, humidity, light) for smarter crop management
- 3) Integrate AI-powered camera for plant health monitoring, weed detection, and early disease diagnosis





THANK
YOU ALL