

# Smart Mini Gardens

Integrating IoT Technology for Optimal Mini-Garden Health  
*A Smart Approach to Eco-System Understanding*

**Theme:** Understanding Eco-System and Well-Being

**Sub-Theme:** Technological innovation for ecosystem and health

# Problems

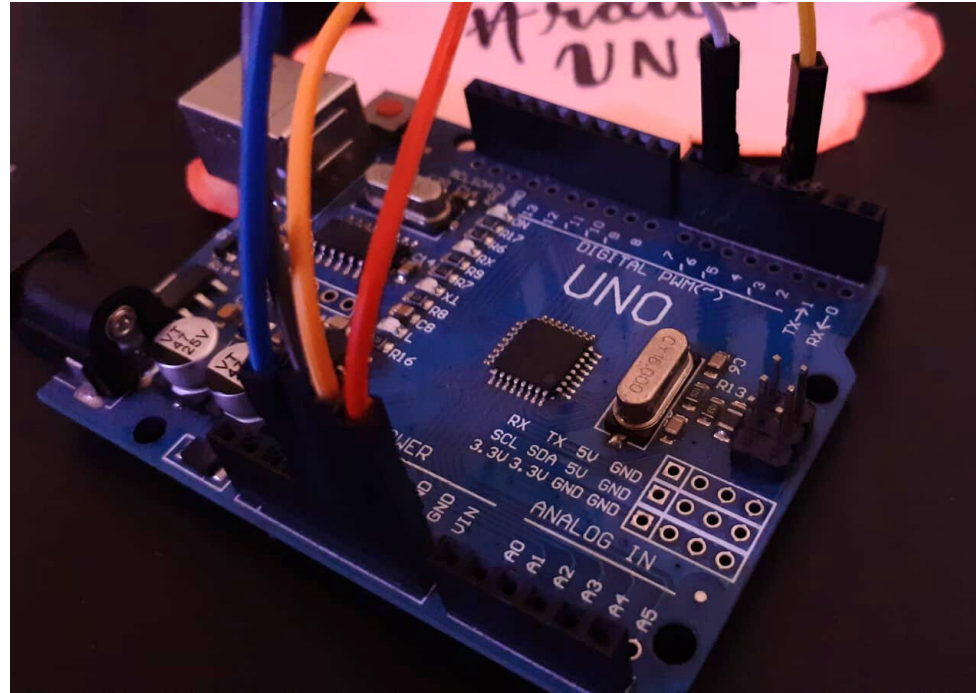
- Inefficient Resource Management
- Lack of Real-time Monitoring

## *Solution*

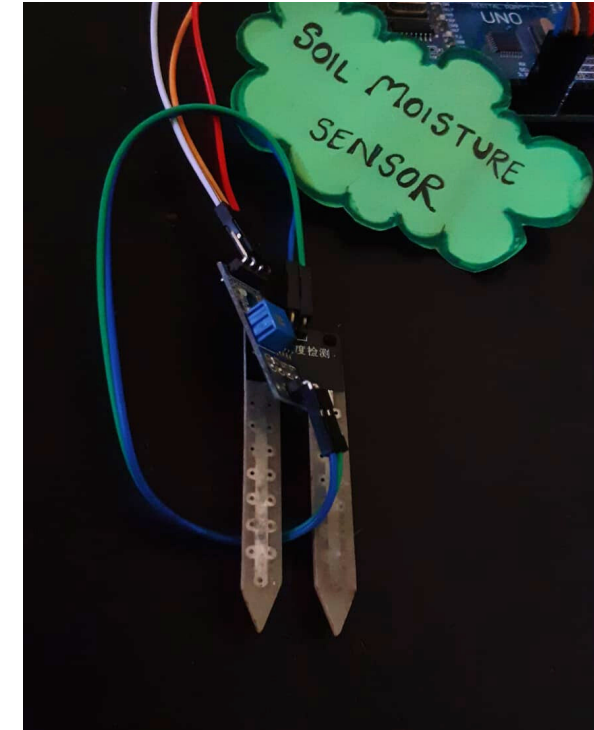
# IoT-Based Smart Soil Detection Software

Imagine urban balconies and roof-tops adorned with a symphony of greenery, each plant intricately connected to a digital ecosystem. Our IoT-enabled mini garden concept brings this vision to life. By equipping these mini gardens with smart sensors, we fuse the natural world with cutting-edge technology.

# How does it work?



**Arduino UNO:** It serves as the central control unit in the smart mini-garden project. It runs the software responsible for monitoring soil moisture levels and controlling the water pump.



**Sensor:** A soil moisture sensor is placed in the garden's soil. It measures the soil's moisture content and sends this information to the Arduino UNO.



**Motor & Battery:** A small water pump is connected to a battery. The motor is used to pump water from a reservoir to the mini-garden's plants. The battery provides the necessary power for the motor to operate.



**Relay Module:** It is used to control the water pump. It acts as a switch that can be controlled by the Arduino UNO. When the soil moisture sensor detects that the soil is too dry, the Arduino triggers the relay to turn on the water pump, providing water to the plants.





# What can be done?



***NPK Sensor:*** By adding NPK this we can detect the content of nitrogen, phosphorus, and potassium in the soil. It helps in determining the fertility of the soil. The sensor can be buried in the soil for a long time.



***Weather Data:*** We can use government weather data to determine if rain is expected. This helps us avoid over-watering by adjusting the watering schedule accordingly



# CONCLUSION

In the mosaic of well-being, the Eco-System concept intricately intertwines nature's bounty, individual health, and economic vitality.

Our IoT-integrated tool further enriches this harmony, propelling us toward a future where smart technology nurtures resilient ecosystems, enhances personal well-being, and fuels economic prosperity.

With this innovation, we step onto a transformative path, where the threads of nature, technology, and well-being converge to weave a tapestry of sustainable coexistence.