

# **EE356 - PROJECT PROPOSAL**

## **GROUP 06**

FERNANDO H.H.D (E/17/084)

GURUGE S.P.W.P (E/17/103)

KARUNASENA I.C. (E/17/157)

# **EE 356: ELECTRONIC PRODUCT DESIGN AND MANUFACTURE PROJECT PROPOSAL**

**Title** : **Smart Irrigation Control System**

## **Introduction :**

Due to population growth and demand for resources growing rapidly, water shortage is a major threat to agriculture. Growing Population and limited resources put pressure on farmers to produce more with less. Farmers must contend with increasing water shortages, limited land availability, and unstable costs,

While there are many factors that impact the health and quality of the harvest, water is perhaps one of the most vibrant. Irrigation management plays an important role in ensuring that crops are getting the right amount of water at the right time.

We can effectively control water wastage and plan the water requirement for the crops. Trigger actions based on sensor data to switch pump on and off, depending on irrigation needs and level of resources. Enhance the efficiency of your crop yields. Smart irrigation helps growers improve the efficiency and consistency of their yield by enabling water management effectively: Stay on top of changing conditions across agricultural environments by tracking temperature and humidity with smart sensors. Automatically trigger sprinkler systems to address low moisture levels in the soil to prevent crop damage or loss.

# Product Description

## Specification

Body	Dimensions	15cm x9cm x5cm
	Weight	500g
Display	LCD 16x2	
Development Platform	Arduino UNO	
Relay		5V DC
Water pump		3-5V DC
Power Supply	Battery	9V DC

## Functions

- Automatic watering functionality
- Can display real time conditions

## Limitations

- Battery life
- Area to be watered
- Altitude to be watered

## **Market Analysis**

According to the market survey, there are various kinds of smart irrigation systems. Usually, irrigation is used in areas where rainfall is irregular or dry times or drought is expected. One of the greatest advantages of a smart irrigation system is its ability to save money by reducing water waste. Another advantage is precision watering that deals with efficiencies in the delivery of the water that increase the landscape health. Smart irrigation controllers allow users to adjust their irrigation schedule.

Irrigation systems benefit for both environmental and cost-effective reasons. So, switching to smart irrigation is the clear solution for a sustainable future.

### Pros-

- Traditional irrigation systems are pre-set manually to turn on and off using a timer. But this system is automated
- Monitor weather conditions and control watering according to that
- Automatically adjust watering schedule according to soil and weather conditions
- Allow farmers to grow high quality crops that needs special attention
- Precision watering

### Cons-

- Need more sensors to increase the accuracy
- Somewhat expensive
- Depending on size of property, more systems will be needed
- Sometimes creates unrestrained excretion and percolation of water throughout the whole passage.
- System is not water resistant
- Soil moisture sensor has relatively slow response time to soil water changes.

## Methodology

Two sensors are used to measure the conditions of the plant's environment. The soil moisture sensor captures the moisture condition of the soil, and the humidity sensor captures the condition of the air. Those two condition variables are gone through a program function and processed to admit the perfect condition for the plant. Thereafter, the watering system is activated, and the watering process begins according to a suitable set of water levels. Meantime, the condition of the air and soil are displayed from the display.

The DC water pump is powered by a battery and controlled by a relay device which is controlled by an Arduino console.

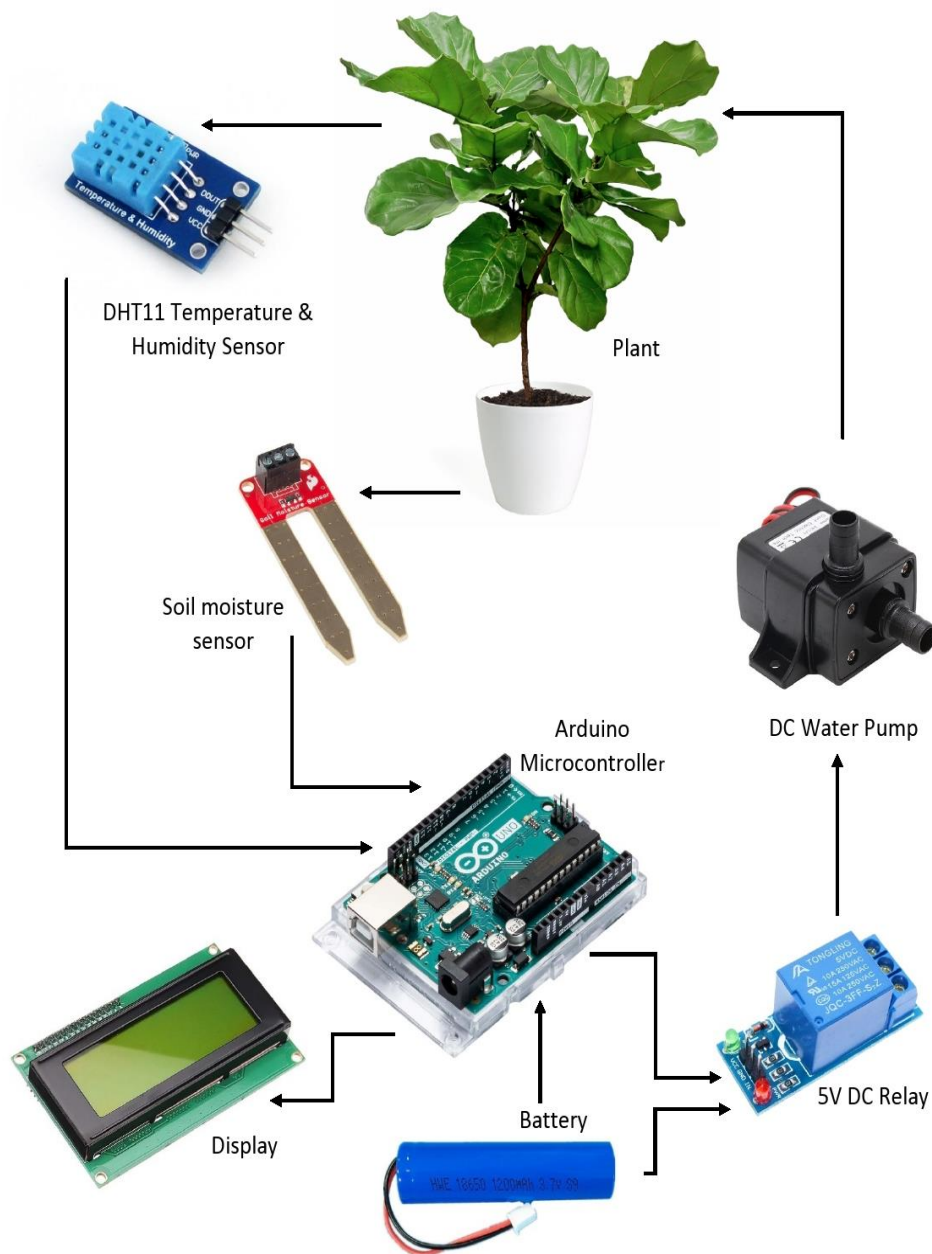


Figure 01: Device Block Diagram

## **Proposed Budget:**

<b>Component</b>	<b>Unit Cost (Rs)</b>	<b>Number of units</b>	<b>Total Cost (Rs)</b>
Arduino Uno Board	2475.00	1	2475.00
Moisture Sensor	220.00	1	220.00
Humidity Sensor	540.00	1	540.00
Breadboard	545.00	1	545.00
Resistor 1k	10.00		10.00
Water pump	980.00	1	980.00
Battery	800.00	1	800.00
Jumper wires	250.00	40	250.00
5V Relay module	100.00	1	100.00
Alphanumeric LCD	715.00	1	715.00
<b>Total</b>			<b>6635.00</b>

## Timeline

[illegible]