SMART IRRIGATION

**Project objectives:**

* To save water and reduce human intervention in the agriculture field
* Continuously monitoring the status of sensors and provide signal for taking necessary action
* To get the output of soil water sensor and provide water to crop
* To observe other parameters for better yields

**Introduction**

* Monsoon dependent indian agriculture
* Automatic irrigation
* Over irrigation and under irrigation
* Soil moisture,temperature, air humidity and water level in the soil are wirelessly transmitted using wireless technology for better production

**Components used:**

* Sensors
* ESP 32
* Motor
* Motor driver
* Jumper wires

**Sensors**

For this project we require three sensors namely

* Moisture sensor
* Ultrasonic sensor
* IR sensor

**Ultrasonic sensor**

SPECIFICATIONS:

* Operated at 5V
* Measuring distance:2cm-450cm
* Here the module has two projects in the front which form as ultrasonic transmitter and receiver

PURPOSE**:**

Transmitter transmits an ultrasonic wave which is received back by the receiver which is reflected back when the wave is objected by the water and the distance is calculated

**IR sensor**

SPECIFICATIONS:

* Operated at 5V
* Module consists mainly of IR transmitter and receiver,variable resistor and output LED

PURPOSE:

* Used to detect the obstacle (i.e., presence or absence of an object)

**Drip irrigation**

* It is a technique in which water flows through a filter into special drip pipes with emitters located at different spacing.
* It is most efficient water and nutrient delivery system.

**Moisture sensor**

SPECIFICATIONS**:**

Common type is frequency domain

* Neutron moisture gauge
* Input voltage:12VDC

PURPOSE**:**

* In this sensor we are using two probes to be dipped into the soil as per moisture we will get analog output variations from 0.6-12v
* WORKING
* STAGE-1:FILLING UP RAIN WATER
* IR sensor detects the presence of an object which is used instead of using a sensor which takes speed or pressure of rain
* It is given to ESP32 by which motor gets on when there is heavy rainfall
* STAGE 2:level of water in tank
* Ultrasonic sensor is used to know the level of water and hence tank is filled till a particular threshold value of distance
* STAGE 3:DRIP IRRIGATION
* A moisture sensor is used to read the moisture content in soil
* If it is dry the motor starts automatically which supplies water using drip irrigation

Also a web page is created to display sensor values

* **Advantages**
* Increase in productivity
* Reduced water consumption
* No manpower required
* Reduce soil erosion and nutrient leaching
* Requires smaller water sources
* **Conclusion**
* Smart irrigation system is feasible and cost effective for optimizing water resources for agricultural production
* This irrigation system allows cultivation in places with water scarcity thereby improving sustainability
* It proves that the use water can be diminished