

Automatic Irrigation System

Submitted By:
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Introduction:

- Automatic irrigation systems are convenient for the farmers to water the fields and save soil degradation.
- If installed and programmed properly, automatic irrigation systems can even save you money and help in water conservation.
- Damaged crop can be expensive. But the savings from automatic irrigation systems can go beyond that. Watering with a hose or with oscillator wastes water. Neither method targets plant roots with any significant degree of precision.
- Automatic irrigation systems can be programmed to discharge more precise amounts of water in a targeted area, which promotes water conservation and also solve the problem of soil degradation.
- It can further be upgraded to a greenhouse project for maintaining the atmospheric situation for better growth and safety of the yield.

Problem Statement:

- Groundwater has rapidly emerged to occupy a dominant place in India's agriculture and food security. It has become the main source of growth in irrigated area, and it now accounts for over 60 per cent of the irrigated area.
- About 70 per cent of the paddy and wheat production in the country is from irrigated areas. Heavy subsidies in electricity consumed for agriculture have tended to encourage wasteful use of energy and water. This has also encouraged farmers to overdraw water from deep aquifers, causing substantial depletion of the water table and deterioration of water quality in many cases.
- There has been unprecedented crop diversification, due to unregulated groundwater development. The preference for water-intensive crops like rice, sugarcane, banana, cotton, etc., is high in regions known only for groundwater availability.
- It is to be clearly understood that despite huge groundwater potential for agricultural growth, the country is heading towards an irrigation crisis.
- Irrigation is a big challenge to improve development of plant in respect of its growth and to reduce costs which leads to an innovative idea of using an automated irrigation system which will further help in better management of water and human resources.

Aim:

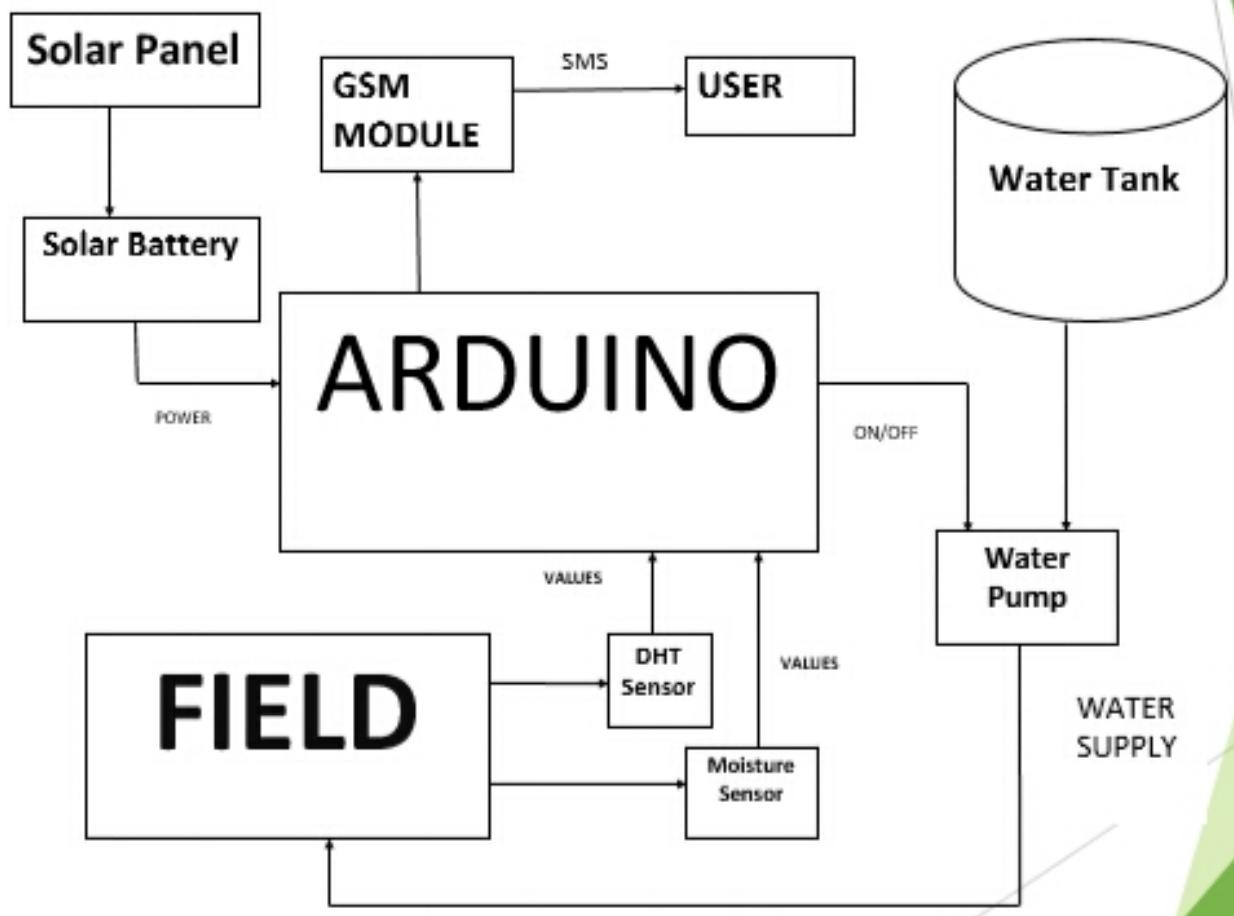
Automated irrigation systems have been developed using sensors technology with Arduino to efficiently utilize water for irrigation purpose.

Working:

In this project, we have used two sensors.

- ❖ FC- 28 Soil moisture sensor - measuring the moisture of the soil and runs the water motor to maintain the moisture content of the soil, if it decreases.
- ❖ DHT 11(digital humidity and temperature sensor) - reading the temperature, humidity and runs the fan to regulate the temperature of the field, if the temperature rise.
- ❖ Moisture is measured in percentage, so we need to convert these values to a new scale measuring zero to 100. This percentage is then being displayed on the LCD.
- ❖ When the moisture sensor measures the value 0 to 60 (depend on the demand of the plant) than the pump motor starts else stop.
- ❖ The DHT11 sensor gives output in the digital form and is fed directly through the digital I/O pins of Arduino.
- ❖ The Arduino reads this output and calculates temperature, humidity, and the heat index. These values are then displayed on the LCD.

FLOWCHART



Conclusion:

This Project is need of the hour to convert manual irrigation into an automated irrigation, with the help of soil moisture sensor will detect dankness content of soil leading to turn ON/OFF of pumping motor. Human efforts can be reduced using this technique and increase saving of water by efficiently irrigating the plants. The design has been made with better resource management and low power consumption.



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DEPARTMENT OF MATHEMATICS

Dr Sumeet Gill

Professor

To Whomsoever It May Concern

I am pleased to recommend the paper "Automatic Irrigation System & Hydrogen Fuel Cells" being researched by Master Saksham Bansal.

Master Saksham is a brainy student who I have observed since he was a child. When he approached me for his projects and research papers, I was overjoyed and eager to discover what he had accomplished. His approach and methodology to the subject matter were very refined. His paper very well defines the mathematical analysis and derives concrete results and solutions much better than senior researchers in my Department.

As a professor of computer science and with over 20 years' research experience, I can conclude that such results can only be achieved by working with substantial data and research.

In his work on an irrigation system, he has worked on preventing soil degradation, conserving water, and demonstrating his understanding of microprocessors, sensors, and embedded systems. His concern for the environment has moulded him into a research-oriented student.

Additionally, his work on 'Hydrogen Fuel Cells' revealed his vision and his goals for the future. He strives to achieve significant goals through the application of solutions-oriented approaches in his projects and papers. The papers have been curated with scant or no support.

Saksham is highly motivated, intelligent and has superior analytical skills. I strongly recommend his paper and hope to see the implementation of his ideas in the near future.

I would be happy to assist you further or provide you with any additional information if needed.

Warm Regards

A handwritten signature in blue ink that reads "Sumeet". Below the signature, there is a date "22" and a small mark that looks like a stylized "U".

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