# Smart Irrigation System

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***Abstract-*** **In this paper, we have studied that, the farmers face some difficulties in their agricultural farm such as scarcity of water and high electricity power. A detailed survey in this regard has been taken from some farmers in the village. In the village, the farmers are not able to optimize the level of water and electricity consumed in the agriculture land. So a cost effective solar power can be the answer for all our energy needs and to develop a system that will minimize the waste of water in an agricultural experiment station farm by smart irrigation system have been designed for this difficulty.**

## I.INTRODUCTION

Smart irrigation system is a need that is to be performed every day, repeatedly. This system conserves electricity by reducing the usage of grid power and conserves water by reducing water losses. The MCU is the total control of the smart irrigation system; the electric energy obtained stored use in a battery. Relay Controller is used to control the dc pump and the water pump along with an automatic water flow control using a moisture sensor. It is a simple type of automated project

## II COMPONENTS AND DESCRIPTION

The major components of the system which involved in the fabrication process of smart irrigation system as follows.

1. solar panel(12 V)
2. Battery
3. MCU (8266)
4. DC pump(12 V)
5. Relay Controller
6. Mist nozzle
7. Soil moisture sensor

1. Solar panel

A solar panel works by allowing photons, or particles of light, to knock electrons free from atoms, generating a flow of electricity. (Photovoltaic simply means they convert sunlight into electricity.) Many cells linked together make up a solar panel. The electric energy are stored by using battery

2. Battery

This 12V battery charger circuit charges the battery at a particular voltage. Once the maximum charging voltage is attained, the charger changes the output voltage to float voltage for maintaining the battery at that voltage. It is used to distribute the electric power to all over the smart irrigation system

3. MCU (8266)

Description Node MCU is an open-source firmware and development kit that helps you to prototype or build IOT product. It includes firmware which runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module. The firmware uses the Lua scripting language. It is used to control the all over system of smart irrigation system.

4. DC pump(12 V)

Smaller electric water pumps, such as the kinds used in homes, usually have small DC motors. The DC motor is contained in a sealed case attached to the impeller and powers it through a simple gear drive. Through a series of pushes, the rotor continues to spin, driving the impeller and powering the pump. The dc pump is connected through the relay controller.

5. Relay Controller

Relays are switches that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. When a relay contact is Normally Closed (NC), there is a closed contact when the relay is not energized. Relay Controller is used to control

the dc pump and the water pump along with an automatic water flow control

6. Mist nozzle

One of the most important components of a cooling system is the misting nozzle. Where water is forced through nozzles, forming droplets which evaporate into mist when they reach the outdoor air. This can reduce the temperatures by 35 to 40 degrees Fahrenheit. Misting systems use water for humidification, cooling and other forms of environmental control. We are often asked "how much water is actually used." The simple answer is this: approximately one gallon of water per hour per nozzle using a standard misting nozzle.

7. Soil moisture sensor

Soil moisture is the water present in the space between the soil particles. Soil moisture influences the physical, chemical, and biological characteristics of the soil. Soil moisture is the percentage of moisture (on a weight basis) in a soil sample at any given time. It shows general moisture content of the soil

## III WORKING

A solar panel which converts sunlight into electricity is used to generate the flow of electricity. A DC pump such as the kinds used in homes consist of a DC motor, is used here to generate the flow of water. A 12 volt Battery charger circuit is used to charge the battery at a particular voltage. This Battery circuit is also used to vary the input and output voltage. A soil moisture sensor is used where it is present in the space between soil particles. This soil moisture sensor is used to predict the general moisture content of the soil. Relay controller is used here in which it is used to control one electrical circuit by opening and closing contacts in another circuits. A mist nozzle is used in which is considered as the most important components of cooling system. The water is forced through these nozzles forming droplets which evaporate into mist when they reach the outdoor air. A Node MCU is used here to build the IOT product

## IV 2D DIAGRAM

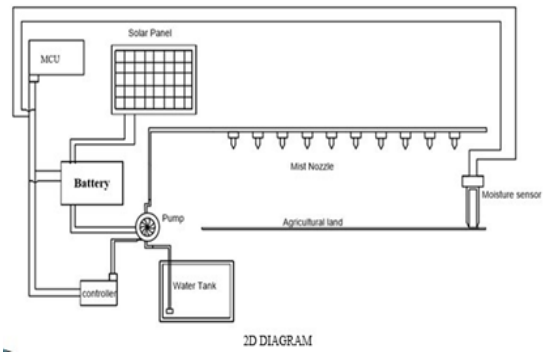


Fig: Front View of System Assembly

## V CONCLUSION

The trip irrigation system which is in practice needs man power to achieve good result. In this project we eliminate human effort by introducing automation technique in the work field using software.

## VI FUTURE SCOPE

By Using a GSM (Global System for Mobile) we can achieve a long range of communication to activate the system.

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