

Rain Sensor integrated with irrigation system used for save water in farms



Requirement specification document:

Water is one of the vital resources on our planet, which is the main constituent of Earth's hydrosphere and the fluids of all known living organisms. From this point, I decided to build an IoT system capable of saving irrigation systems water depending on rains water

The idea of this project is about integrating a rain sensor system with traditional irrigation systems in the farms which used for collecting and recording rain levels data in farms to stop the irrigations systems when it is raining or about to rain. Moreover, because this system is depending on IoT technology we can collect the and analyze data during the year to provide useful insights that help in taking decisions in the future.

This IoT project includes the following parts:

- 1- NodeMCU ESP8266 (micro-controller with Wi-Fi module): \$3
- 2- Rain Sensor: Steam/Rain Sensor: \$2
- 3- Electronics Components: LED, Resistors: \$0.25
- 4- Power Unit: \$5
- 5- 3D parts for sensor installation purpose: \$5

- User Perspective (Farmer):

1- Install the device in your farm and connect it wirelessly to your irrigation system.

2- download the dashboard software on your PC to monitor sensor data in real time.

3- the device will collect the data and automatically turn off the irrigation system when it rains.

- Designer Perspective (Farmer):

1- the sensor will be connected to a small micro-controller is called NodeMCU ESP8266, this micro-controller will process the data that collected from the rain sensor and record it on PC's user which represent a small data center using MQTT protocol, the collected data will be illustrated on a friendly dashboard by three representation: graphical interface, voltage gauge, & analog signal.

2- the collected data from the rain sensor will help in save water of irrigation system to be automatically stop working when it rains without any human intervention.

Constraints:

- If the sensors and the device are exposed to an amount of dirt or a heavy object collides with it, it may need regular maintenance
- The cost of a single device is less than \$15
- Large Farms could increase the implementation cost since that require several devices to cover the whole area.