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Arduino Based Green House Monitoring and Parameter Controlling System

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Abstract- *Three sensors are used in an IOT-based greenhouse environment monitoring and control project to measure the greenhouse's temperature, light levels, and humidity. The temperature within the greenhouse is measured using a temperature sensor. The microcontroller receives a reading from the sensor. Relays are connected to the microcontroller in several ways. One of the relays has a bulb attached to it. The microcontroller will transmit signals to turn ON the Fan depending on whether the temperature is above or below the threshold value. A light sensor is used to gauge how much sunshine is present inside the greenhouse. The microcontroller receives a reading from the sensor. The microprocessor would send signals to switch on the relay, creating a "shade" in real-time whenever sunlight exceeded the threshold value. The IOT module receives data on these parameters at the same time (ESP8266). No matter whether a threshold mismatch is discovered, the data is relayed to the IOT at regular intervals. A chip called ESP8266 is used to link microcontrollers to Wi-Fi networks, establish TCP/IP connections, and deliver data. These sensors collect data, which is then transmitted to the IOT. The Wi-Fi module must be linked to a hotspot or Wi-Fi zone in order to complete this project.*

Key Words: Green house, IoT, ET.

1. INTRODUCTION

Agricultural practices are not favored by abrupt changes in the weather. Rain that isn't expected can ruin the crops. Or, less rain could cause the crops to dry up. For crops, high temperatures are bad. Some crops even demand certain amount of light. Lack of light can interfere with crops growing properly. The farmers must simultaneously turn on and off the water pump, light supply, fan, etc. to avoid all of these occurrences. Farmers may experience difficulty in such circumstances. This system was created to make farming easier. The farmer is not required to follow all of these items. The farmer's mobile device will receive all of the sensor data. This system reduces the need for labor force. This technology will assist farmers in conducting large-scale plantations with fewer laborers. The soil moisture sensor is a sensor that changes its value when it comes into touch with moisture. Essentially, it is a resistor that operates under moist conditions. When the moisture content is high, the resistance value is low, and when the moisture content is low, the resistance value is high. We used to be concerned about our plants whenever we went out of town for a few days because they require frequent watering. This device automatically waters your plants and keeps you informed by sending text messages to your cell phone. This is a completely automated system, and no human intervention is required to operate it. A greenhouse is a closed structure intended to protect plants from external elements such as climatic conditions, pollution, and so on. It ensures that the plants develop in a sustainable and effective manner throughout the year. Sunlight, temperature, and humidity are all important elements in plant growth. An article on the automated water delivery system for urban residential areas demonstrated that their method may be utilized to manage water resources effectively. Because required physical parameters are difficult to control manually inside a greenhouse, an automated system is required. Many smart irrigation systems have been proposed and

designed using Evapotranspiration (ET), thermal imaging, capacitive methods, neutron scattering methods, and gypsum blocks, to name a few. Sensors with capacitive coupling however, instantaneous are expensive and must be calibrated frequently with variable temperatures.

2. LITERATURE SURVEY

Greenhouses are controlled environments for plant production. Because current greenhouse plants restrict themselves, they cannot be regulated automatically and must be operated manually using various paperwork. To achieve optimal plant growth, the proposed system must be continuously monitored and managed, for example, temperature, moisture, soil humidity, light intensity, and so on. This work demonstrates an Internet of Things-based management method for children's nurseries (IOT). The System can detect obvious situations such as humidity, soil immersion, temperature, fire proximity, light strength, and so on. The NodeMCU esp8266 sends all info from the environment parameters to the tube. When a parameter exceeds the defined limit, the related actuator is activated. If the Earth parameter is not set to the required value, the microcontroller will fail.

3. EXISTING SYSTEM

In the existing system the green house system is different whereas the system is of high cost and high maintained and the labor should be needed for checking and implementing. It would be a burden for the farmer to maintain such systems.

4. WORKING

Flow Chart

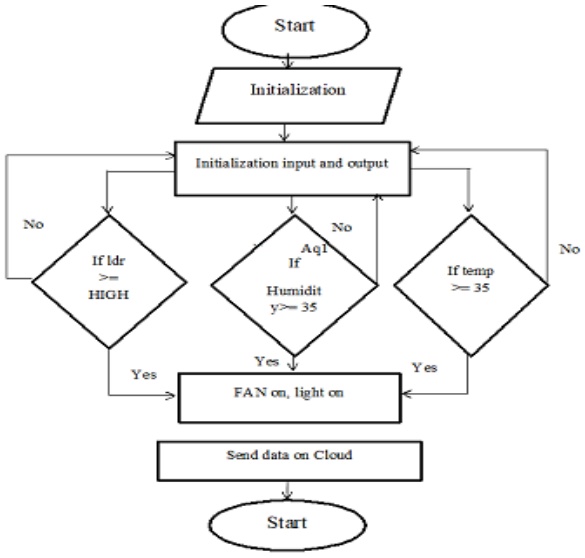

Fig-1: Flow Chart

The established greenhouse system is divided into two sections: monitoring and controlling. To monitor the ambient factors, the monitoring portion includes a DHT11 sensor and an LDR sensor. To transfer environmental parameters to the IOT cloud platform, a NodeMCU esp8266 is employed. The controlling part is made up of exhaust fans and artificial lighting. The system's heart is the Node mcu microcontroller depicts the block diagram of a greenhouse monitoring and controlling system.

The Wi-Fi controller is the standard controller used in this project to interface all of the sensors. When the temperature and humidity looking dht11 sensor passes the edge respect, the two fans are turned on. Otherwise, the two fans will be in bad condition. When the light power isn't consistently fixed motive driving confinement respect, the electric light that is associated with the hand-off will be turned on, else the light will be in the off state. The full sensor data is then sent to the cloud using the NODEMCU (esp8266) module, which is interfaced with Arduino. Using a computer or a mobile device, the user can monitor and manage the environmental parameters.

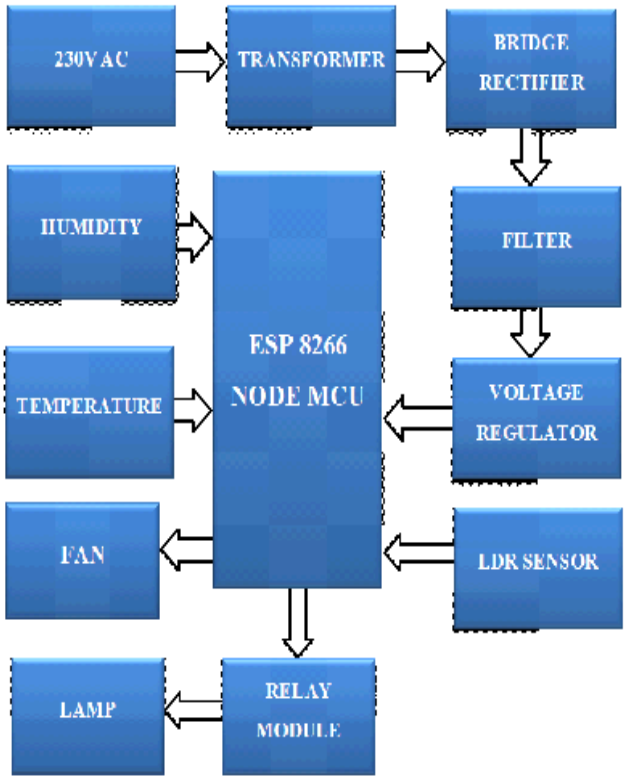

Fig -2: Block Diagram

5. SOFTWARE USED

ARDUINO IDE

BLYNK APP

Fig-3: Front View

6. RESULT

Our initiatives focus on the most basic qualities required for plant growth; the closed greenhouse system is in charge of properly monitoring and controlling variables such as water, sunlight, and manpower.

The Microcontroller connected within the system receives data from sensors and other devices are in charge of controlling; all data is collected and controlled via IoT.

7. CONCLUSIONS

Finally, we conclude that the greenhouse monitoring and controlling system has an impact on its operating capabilities, that it is successful in monitoring the climatic condition within the system, and that the other hardware setups can and do control the ups and downs. The data gathered is saved in the cloud. The primary goal of reducing costs and manpower is accomplished.

Fig-4: Side View

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