Literature survey

Paper 1:

Title : Smart farm and monitoring systems for measuring the environmental condition using wireless sensor network – IoT technology in farming

Conference name and year of Publication: 5th International Conference on Innovative Technologies in Intelligent Systems and Industrial Applications (CITISIA), 2021.

Content:

This paper concentrates on implementing a smart farming system in order to facilitate farmers. They have implemented the proposed system using IoT, wireless sensor technologies and nodes to connect the entire network. The data collected and monitored from the field are soil moisture content and temperature. The designed system collect data from farms and transfer these data to central server using wireless technology and then, the server assigns task to each device present in the field based on the inputs received. They have also designed the mobile application and using this, farmers can set threshold value for each sensor. The different modules used here are:

- **Soil moisture measuring system:** Using this, the moisture data from the field is collected and is sent to central server through WSU (Wireless Sensor Unit) and the received data is compared with inbuilt threshold value. If the collected data is lesser than threshold value, then, the system sends an signal to actuators through WIU (Wireless Information Unit) to turn on watering system and this continues as long as data from field is greater than the threshold.

- **WSU (Wireless Sensor Unit):** To transfer data to central server and to connect all sensors to Arduino board.
- **WIU (Wireless Information Unit):** To communicate between sensors and WSU.
- **Temperature monitoring system:** To monitor the temperature level in the farm.
- **Mobile applications to farmers:** To check the moisture and temperature and to set threshold for all the parameters.
- **Sensor monitoring system:** To check whether all the sensors are working properly or not. It is accessible only by developers.

Paper 2:

Title: IOT Based Smart Agriculture System

Conference name and year of publication :

International Conference on Wireless Communications, Signal Processing and Networking (WISPNET), 2018

Content :

This paper proposed to develop a Smart agriculture System that uses advantages of cutting edge technologies such as Arduino, IOT and Wireless Sensor Network. The paper aims at making use of evolving technology i.e. IOT and smart agriculture using automation. Monitoring environmental conditions is the major factor to improve yield of the efficient crops. The feature of this paper includes development of a system which can monitor temperature, humidity, moisture and even the movement of animals which may destroy the crops in agricultural field through sensors using Arduino board and in case of any discrepancy send a SMS notification as well as a notification on the application developed for the same to the farmer's smartphone using Wi-Fi/3G/4G. The system has a duplex communication link based on a cellular-Internet interface that allows for data inspection and irrigation scheduling to be programmed through an android application. Because

of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated areas.

Components used

- Arduino Uno R3 microcontroller board
- LM 35 temperature sensor
- Humidity sensor
- Moisture sensor
- Motion sensor
- Wi-Fi module
- ESP8266
- GSM module

Implementation and its application :

The sensing phase involves the sensing of the physical parameters which includes temperature, moisture, humidity and motion. All these sensors are attached to the Arduino Uno R3 microcontroller board. This board acts as the IOT gateway in the developed system as it has the capacity to transmit the data to the cloud. This transmission is done using Wi-Fi ESP8266 module.The processing phase takes place in the cloud. The cloud consists of a Web Server, a database where the sensed data is maintained and a decision logic which takes decisions based on the sensed data. In the information distribution phase, the output of the decision logic will be sent to the android application and then to the IOT gateway.

Paper 3:

Title: "Smart Agriculture System using IoT Technology"

Conference name and year of publication :
International Journal of Advance Research in Science and Engineering, 2020

Aim:

This paper highlights the disadvantages of conventional agricultural practices, how it drastically affects the Farmer's life and how Smart Farming using Iot methods such as Precision farming, Efficient Water Management can solve many problems. They highlight how the foreign return Citizens without any job during the pandemic shifted to Smart Agriculture and refuse to leave for their jobs.

Components Used:

- Soil Moisture Sensor
- Raindrop Sensor
- Temperature & Humidity Sensor (DHT11)
- Arduino Uno Board

Method:

They make use of Wireless Sensor Networking System as collection process for information needed by the farmers for cultivation such as changes in environmental conditions like climate, hydrology, plant physiology, humidity, temperature, rain dampness of soil and others and also as Input feeder control system on agricultural machinery.

Soil moisture sensors are fixed under the ground in field. Initially the water level reading is taken and decisions are made according to it. The temperature sensor (DTH11) is fixed at the centre of the field to get the overall reading of temperature of the soil. These sensors are connected to Arduino where we will get the readings. All sensors will send data to Arduino and data will be forwarded to WSN systems. The threshold value will be set according to the crop. The threshold value will be marked based on the requirement of the crop specified and

predefined in the raspberry pi for every sensor. Whenever any sensor reaches a threshold value, message alert is sent to the user and action is taken according to it. The system has checked for the performance with the help of thing speak.com platform to check the Temperature, humidity rain and soil parameters.

Paper 4:

Title: IoT Based Smart Agriculture Monitoring System

Conference name and year of Publication:

International Journal of Scientific Engineering and Research (IJSER), 2020

Aim:

This paper develops an IoT based smart agriculture monitoring system that uses the advantages of IoT is to monitor the agriculture by using the wireless sensor networks and collect the data from different sensors which are deployed at various no des and send by wireless protocol. By using IoT system the smart agriculture is powered by NodeMCU. It includes the humidity sensor, temperature sensor, moisture sensor and DC motor. This system starts to check the humidity and moisture level. The sensors are used to sense the level of water and if the level is below the range then the system automatically stars watering. According to the change in temperature level the sensor does its job. IoT also shows the information of humidity, moisture level by including date and time. The temperature level based on type of crops cultivated can also be adjusted.

Components used:

- Soil moisture sensor
- Temperature sensor (DHT-11)
- Relay

- Pump
- IoT (WI-FI module ESP8266)
- Power supply: 5V, 700mA Regulated power supply
- Arduino IDE
- Thingspeak website

Implementation and advantages:

The working of the system includes soil moisture sensor and it is tested under various climatic conditions. The moisture output readings at different weather conditions is taken and updated. Wi-Fi is used to achieve the wireless transmission. The sensed value is sent to microcontroller through NodeMCU and motor gets pump.

Function of a power supply is to convert electric current from a source to the correct voltage, current and frequency to power up the load. As a result, power supplies are also referred to as electric power converters.

ThingSpeak is an IoT analytics platform which is used to aggregate, visualize, and analyse live data streams in the cloud. When the data is sent to Thingspeak from the devices, it creates instant visualization of live data and sends an alert.

It is easy to maintain and cost is reasonable to purchase. The components which are used are easily available. It has advantage to observe the status on smartphone or laptop using internet. The information is up to date even in absence of farmer.