

# IOT Based On Smart Agriculture

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**Abstract**—This paper is for internet of things in agriculture to be used by farmers in their Agriculture lands, they can use “soil moisture sensors”. This sensor system which monitors and maintains the desired soil moisture content via automatic water supply. It is used to get information’s about environmental conditions such as light, dust, humidity or sudden changes in temperature. The setup uses soil moisture sensors which measure the exact moisture level in soil. The value active the systems to use appropriate quantity of water avoids over/under irrigation. Usually the farmer pumps the water more or less to cultivate the land. This may result in wastage of water or insufficiency to the crops. Motion Sensors will create alert SMS/Text messages. That alert messages will be send to farmer’s phone when they detect motion. This model sends an alerting message to the farmer when the moisture level increases or decreases in the field.

**Keywords**—Soil Moisture Sensors, PIR Sensors, Wireless Sensors Network.

## 1 INTRODUCTION

The terms of internet of things (IOT) was first invented in 1998 which network of networks typically; a large number of objects or sensors are connected through communication between information infrastructures to provide value-added service. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

## 2 LITERATURE SURVEY

The IoT is evolving, growing and becoming popular day by day; in the today’s world, around 5 billion

- IoT is gaining much importance these days as every object in the network will become a computer.
- The idea of IoT has become successful due to the invention of recent technologies like sensors, RFID and WSN.

## 3 SMART AGRICULTURE

The world agriculture is undergoing industrialization, it is important to develop agricultural interdenominational same time. The Agricultural intercolumniation has become the trend of development for the world agriculture. As far as Ideas agricultural development is concerned with, the agricultural intercolumniation is a major force promoting the agricultural development and transformation and a corner stone for maintaining sound and sustaining economic development. In a past few years, we have been focus-in on agricultural information service and infrastructure development. After many years of hard efforts, remarkable results had seen in agricultural infrastructure development.

objects have connected through the internet. In 2020, it has estimated that near about 50 billion objects will be connected to the internet. IoT is providing tremendous opportunities for novel. Applications, which are now widely used in many aspects of life such as intelligent home monitoring system, products supply chain management, precision agriculture and much more. Every object in IoT is addressable, recognizable, readable and locatable through the internet by using RFID (Radio Frequency Identification), Wireless Sensor Network (WSN) or other means. The concept of IoT is using many in different domains such as; precision agriculture, products supply chain management, Smart Grid, environmental monitoring, cloud computing and many more.

These infrastructures provided to foundation for agricultural information service. However, the problems still exist in India’s agricultural information. For an example, we put more emphasis on hardware than software and could not provide high quality information to meet the production needs of farmers. Moreover, information is not sufficiently used by farmers and the effect of information on agriculture, farmers and rural area is not that notable. To change this situation and promote fast development of agricultural inter-columniation, it is now necessary to use the cloud computing and visualization technology to constructs agricultural information cloud [10], which combines the IOT technology and RFID technology, so we have to realize smart agriculture. The agro ecological environment control subsystem in-clouds: Water quality monitoring, automatic improve-meant of water quality Accurate fertilization saves fertilizer Monitor soil constituent, soil humidity, light, wind, air, etc. The agricultural resource control subsystem includes: Intelligent greenhouse that allows automatic adjustment of temperature Water irrigation that can automatically control flow and save water Scientific disease and pest monitoring The production process control subsystem includes: Identification of individual animals allows healthy cultivation Monitoring of animal and plant growth.

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#### 4 SOIL MOISTURE SENSOR

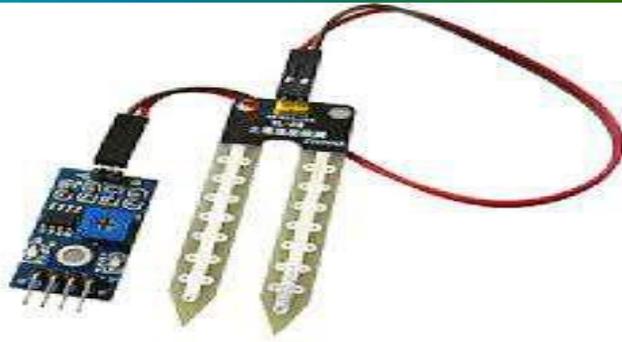


Fig: Soil Moisture Sensor

Soil moisture sensor is a sensor which senses the moisture content of the soil. The sensor has both the analog and the digital output. The digital output is fixed and the analog output threshold can be varied. It works on the principle of open and short circuit. The output is high or low indicated by the LED. When the soil is dry, the current will not pass through it and so it will act as open circuit. Hence the output is said to be maximum. When the soil is wet, the current will pass from one terminal to the other and the circuit is said to be short and the output will be zero. The sensor is platinum coated to make the efficiency high. The range of sensing is also high. It is anti-rust and so the sensor has long life which will afford the farmer at a minimum cost.

#### 5 PIR SENSOR



Fig: PIR Sensor

All objects with a temperature above absolute zero emit heat energy in the form of radiation. It is invisible to the human eye since it radiates infrared wavelengths. PIR sensors don't detect or measure heat, instead they detect the infrared radiation emitted or reflected from an object. It is used to detect the movement of people, animals or other objects. They are commonly used in burglar alarms and automatically activated lighting systems. When a human passes in the field, the temperature at that point will rise from room temperature. The sensor converts the resulting change into a change in the output voltage and this triggers the detection.

#### 6 WIRELESS SENSOR NETWORK

Temperature sensor and Humidity sensor senses the temperature and humidity respectively and if the value crosses the threshold then room heater or cooling fan will be switched ON/OFF automatically providing temperature and humidity maintenance. will also controls water pump depending upon the soil moisture data sent. a smart irrigation node with features like ; Smart control of water pump based on real time field data i.e. automatically turning on/off the pump after attaining the required soil moisture level in auto mode, Switching water.Pump on/off remotely via mobile or computer in manual mode, and continuous monitoring of soil moisture. Moisture sensor transmits the data using HT12E Encoder IC and a RF transmitter. The transmitted data is received by node2 and there it is processed by microcontroller in order to control the operation of water pump.

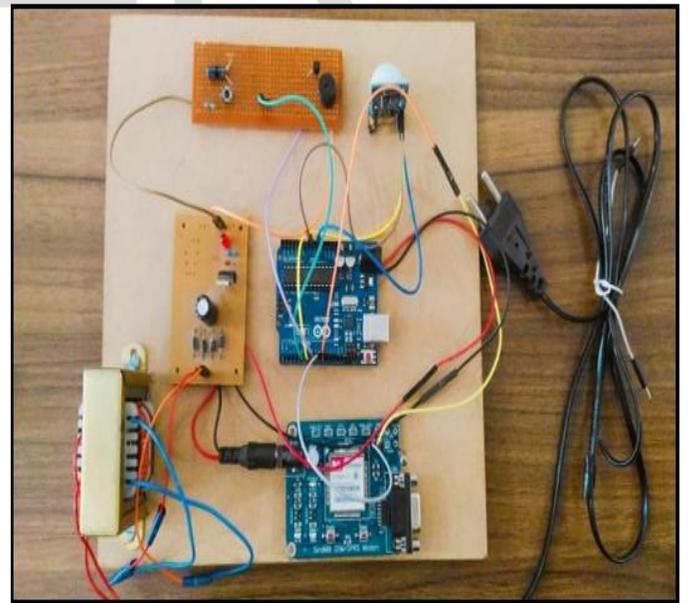
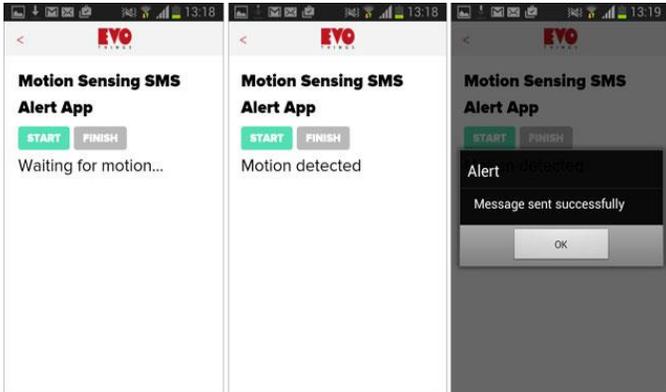


Fig: working model

## 6.1 Weather Monitoring applications



Weather monitoring is an important area of interest for our daily life and can be predicted by detecting numerous atmospheric weather-related parameters such as temperature, amount of rainwater, wind velocity, air pressure, wind velocity, natural disaster monitoring, and on land snow coverage and urban heat effects. One of the important considerations is collecting data related to the forests and their health can predict future falling of leaves and update harvesting information. The quality of groundwater depends on how it moves through the unsaturated soil and finally to water area.

### 6.2 SMS/Text Messages Alert for Motion Sensors

When the alarm is set to water supply the motion sensors will still send text messages to farmer's phone when they detect motion. I would think that the motion sensors would be off when the alarm is off. It would be an option to have motion sensors off when the alarm is off, get able to still be in SMS/Text mode. Alert's gives you several options to stay connected with your important things, including:

- ❖ Smartphone App
- ❖ Text message
- ❖ Email

This intruder Alarm detects motion and sends a text message alert to your phone with Wi-Fi, so you can receive the text anywhere.

## 7 CONCLUSION

A system to monitor moisture levels in the soil was designed and the project provided an opportunity to study the existing systems, along with their features and drawbacks. The proposed system can be used to switch on/off the water sprinkler according to soil moisture levels thereby automating the process of irrigation which is one of the most time-consuming activities in farming. Agriculture is one of the most water-consuming activities. The system uses information from soil moisture sensors to irrigate soil which helps to prevent over irrigation or under irrigation of soil thereby avoiding crop damage.

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