



## IOT BASED AGRICULTURE MONITORING SYSTEM

<sup>1</sup>Mr.Mohith KC, <sup>2</sup>Mr.Tanish Aiyanna IM

<sup>1</sup>Electronics & Communication, Coorg Institute of Technology, Ponnampet, Kodagu.

<sup>2</sup>Electronics & Communication, Coorg Institute of Technology, Ponnampet, Kodagu.,

### ABSTRACT

*Agriculture plays an very important role in the development of our country. It is also an basic source of an livelihood people in india, and also agriculture has been hindering the development of our country due to the migration of people from rural areas. The only solution for this problem is smart agriculture by making agriculture modern by the current traditional methods of agriculture with the help of Automation and IoT Technologies. Smart farming is an trending concept, where IoT sensors are capable of providing information about agriculture fields IoT enables various applications such as crop growth monitoring and selection, irrigation decision support etc. IoT has introduced smart farming to each and every farmers neighborhood while offering constructive green agriculture. Continious sensing and monitoring of crops by convergence of sensors with the help of Internet of things and making farmers to aware about crops growth, harvest time periodically and in turn making high productivity of crops and also ensuring correct delivery of products to end, consumers at right place and right time. So to overcome this problem we go for smart agriculture technique using Internet of things.*

### INTRODUCTION TO SMART AGRICULTURE MONITORING SYSTEM

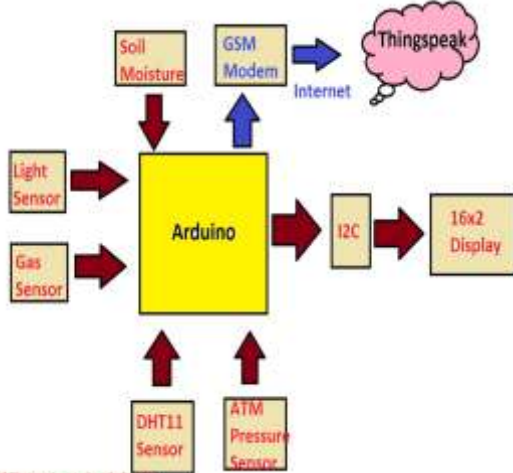
Smart agriculture monitoring system or simply smart farming is an emerging technology concept where data from several agricultural fields ranging from small to large scale and its surrounding are collected using smart electronic sensors. The collected data are analyzed by experts and local farmers to draw short term and long term conclusion on weather pattern, soil fertility, current quality of crops, amount of water that will be required for next week to a month etc. We can take smart farming a step further by automating several parts of farming, for example smart irrigation and water management. We can apply predictive algorithms on microcontrollers or SoC to calculate the amount of water that will be required today for a particular agriculture field. Wheather if there was rain yesterday and the quantity of water required today is going to be less. Similarly if humidity was high the evaporation of water at upper ground level is going to be less, so water required will be less than normal, thus reducing water usage.

### ROLE OF IOT IN SMART FARMING.

IoT is here to reduce the manual labour involved in collecting these crucial agricultural data. If manual labour is involved we have to deploy several thousands of personnel to different agricultural sites to collect the tedious readings every single day and there will be no assurance in the data integrity since we are humans we may get inert and may manipulate the data which could push the expert conclusions in wrong direction. Using IoT we can directly send the collected data to a central server in real time. Since we have automated the date collection, the data integrity is assured and since the data processing is done using computers, experts may get advanced analytical software tools to draw most accurate predictions.



### BLOCK DIAGRAM OF SMART AGRICULTURE MONITORING SYSTEM



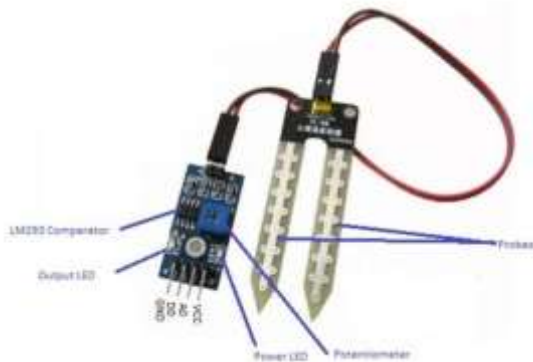
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The project consist of 8 major components, where Arduino act as a brain for this project,

1. Soil moisture sensor
2. Light sensor
3. Arduino uno
4. DHT11 sensor
5. GSM module
6. MQ135 sensor
7. LCD Display
8. BMP180 sensor

### HARDWARE USED

#### 1. Soil moisture sensor



It helps in sensing the moisture content of the soil .The soil moisture can be measured using the illustrated sensor, which has two prongs (electrodes) which are to be inserted on top layer of soil. It is based on Ohm’s Law and uses resistance between the poles in order to Calculate the moisture of the soil.

#### 2.Light sensor



It is important to have a plant good sun shine to prepare its own food which requires optimum amount of light. Amount of light received on a plot of land can be measured using photoresistor. of light received on a plot of land can be measured using LDR or photoresistor. Here LDR helps in changing the electric resistance which depends on the amount of light incident on it.

#### 3.Arduino uno



Arduino which is a microcontroller used to control the working of the sensors and manage the working of the device. comes with the various number of pin which are categorized as output and input pins that may be interfaced to various expansion boards and circuit.

#### 4.DHT11 sensor





The DHT11 sensor is used to measure the temperature and humidity present in the atmosphere. This sensor keeps a track of the temperature and humidity in the crop field so that a separate mechanism can be developed to regulate the temperature in case farming is done in closed environment. Here one pin is used to transmit the signal, second pin is used to receive the signal and the last pin is used for data transfer.

### 5. GSM module



A GSM modem or GSM module is a hardware device that uses GSM mobile telephone technology to provide a data link to a remote network. This module will send data to the register set of devices and cloud for analytics.

### 6.MQ135 sensor



Air quality is a very important parameter to judge the growth of crops, to do this we are using MQ 135 air quality sensor. MQ 135 comes with a breakout board and it has 4 terminals and we are going to use just 3 of them Vcc, GND and Aout which is analog output of the sensor, Dout is not here. When MQ 135 detects

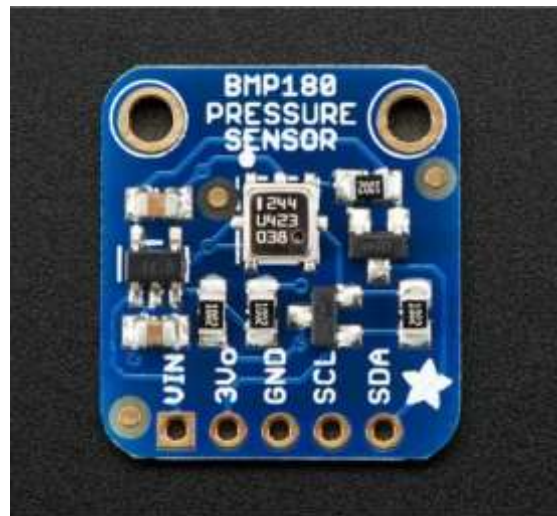
toxic gases the analog output value increases and vice versa. The analog output is converted into 10-bit digital value and converted to percentage out of 100.

### 7.LCD display



It is used to display the data locally and helps in operating the device standalone. Here each character is represented with 5\*8 pixel matrix which operates at 4.7v to 5.3v.

### 8.BMP180 sensor



A barometric pressure sensor can be used for measuring atmospheric pressure altitude and temperature. By using this we can predict weather for short term and also helps in studying how plants behave in different atmospheric pressure conditions.

## ➤ LITERATURE SURVEY

Prof. Patil K. A et al. (2016) [6], proposes a wise agricultural model in integration with ICT. Prathibha S.R., Anupama Hongal Jyothi M.P. Created monitoring temperature and Humidity in agriculture field through sensor using CC3200 Single chip. Camera is interfaced with CC3200 to capture images and send that pictures Through MMS to farmers mobile using Wi-Fi [5]



Shakthipriya N et al. (2014) [7], As mentioned reviews the state of art wireless sensor technology in agriculture based on the value of soil moisture sensor the water sprinkler during the period of scarcity of water.

### FUTURE SCOPE

- Wireless monitoring of field reduces the human power and it also allows user to see accurate changes in crop yield.
- The crops grown using this mechanism will grow much Faster and will be organic.
- The crops can be sown cultivated And harvested without human intervention.

### CONCLUSION

The proposed smart agriculture monitoring is very helpful for the farmers, who is actually in need. Agriculture monitoring system serves as a reliable and efficient system and corrective action can be taken. Wireless monitoring of field reduces the human power and it also allows user to see accurate changes in crop yield.

Also measure moisture of soil And level of water in fields. This system works well in the Ideal conditions and further improvement can be done in future.

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