

# IoT Based Smart Agriculture Monitoring System

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**Abstract:** Agriculture plays an important role in the development of any country. Around 70–75% of the Indian population depend on agriculture and 1/3rd of the capital of the country comes through farming. There have been several issues in concern with agriculture that were hindering the growth and development of the country due to migration of the people from rural to urban. To overcome this problem, the paradigm is toward smart agriculture using several techniques like Internet of Things and big data analysis. These technologies have emerged and modified the cultivation system. By incorporating sensors that study the environment humidity, temperature make cultivation possible by saving farmers time and effort by adding sensors. With the application of IoT, it is anticipated that 28 billion things are going to be connected through Internet and one such being agriculture. The present system is implemented for smart farming using Internet of Things (IoT) sensors, thereby gathering information about the conditions of the crop needs and automatically controlling resulting in improved yield and efficient crop, and the work is implemented using Arduino Uno along with temperature, moisture, soil dryness, and rainfall detector. Using this system, one can monitor from any location and carry out cultivation.

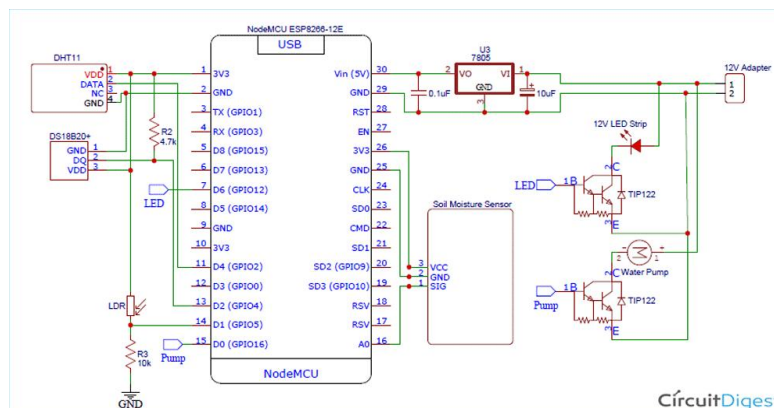
**Keywords:** Agriculture

## I. INTRODUCTION

In this project, we are going to build a **Smart Farming System using IoT**. The objective of this project is to offer assistance to farmers in getting Live Data (Temperature, Humidity, Soil Moisture, Soil Temperature) for efficient environment monitoring which will enable them to increase their overall yield and quality of products. This smart agriculture using IoT system powered by NodeMCU consists of a DHT11 sensor, Moisture sensor, DS18B20 Sensor Probe, LDR, Water Pump, and 12V led strip. When the IoT-based agriculture monitoring system starts, it checks the Soil moisture, temperature, humidity, and soil temperature. It then sends this data to the IoT cloud for live monitoring. If the soil moisture goes below a certain level, it automatically starts the water pump. We previously build Automatic Plant Irrigation System which sends alerts on mobile but doesn't monitor other parameters. Apart from this, Rain alarm and soil moisture detector circuit can also be helpful in building Smart Agriculture Monitoring System.

## II. IOT BASED SMART AGRICULTURE MONITORING SYSTEM

### CIRCUIT DIAGRAM

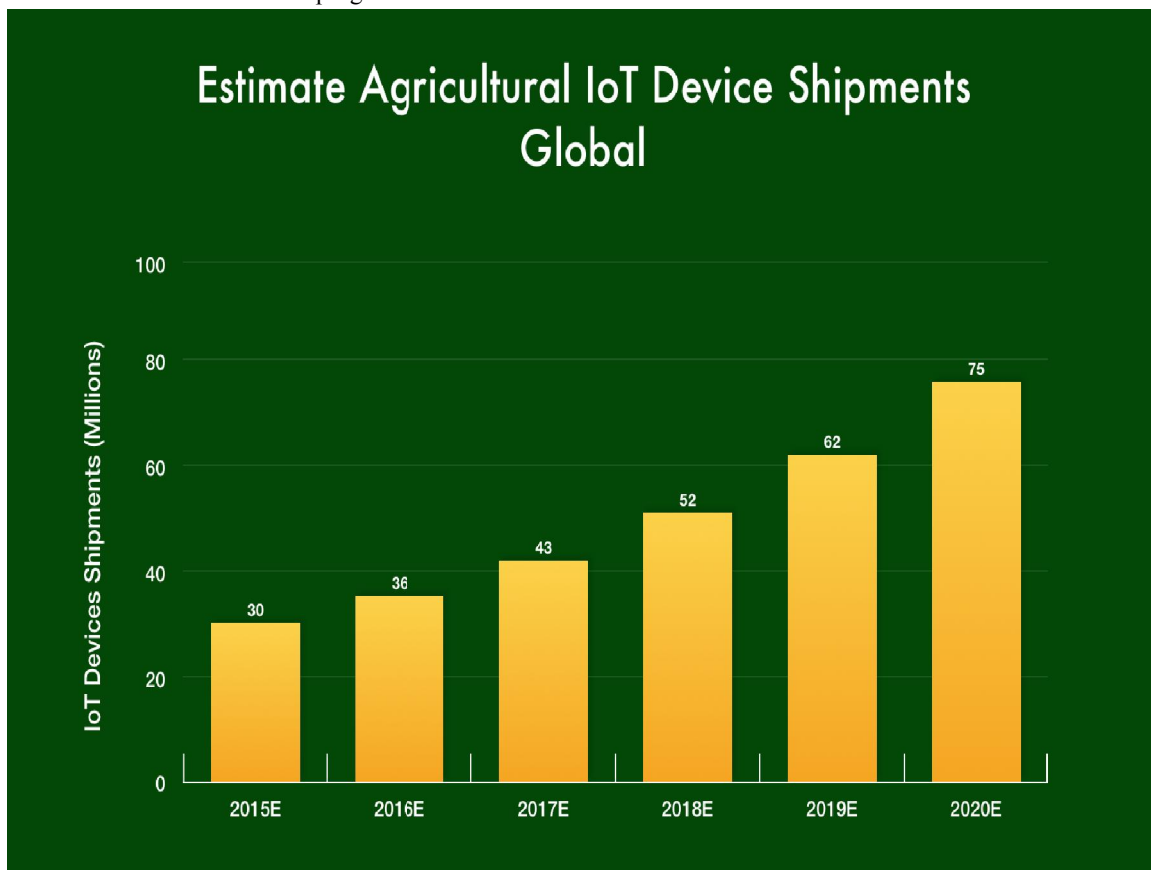


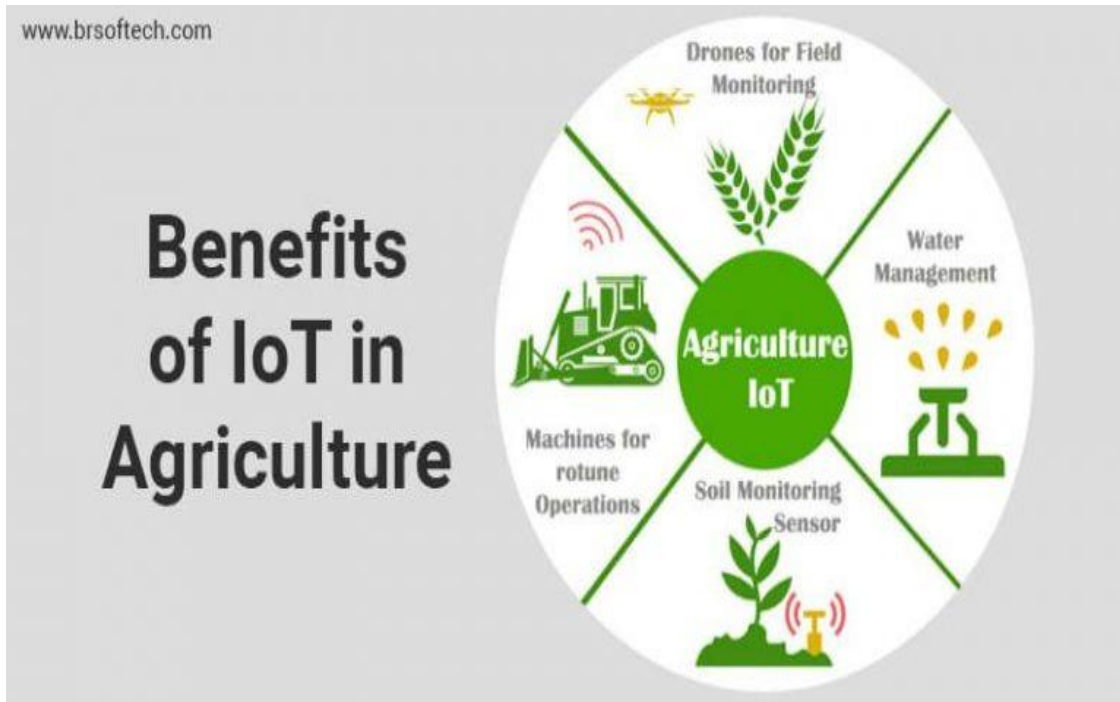
This circuit isn't that hard. Here we have used 4 sensors i.e. DHT11, DS18B20 sensor probe, LDR and Soil Moisture Sensor, one 12V LED Strip, 12V water pump, 7805 voltage regulator, and two TP122 transistors to control Led strip and water pump. 7805 is used to get the regulated 5V from the 12V adapter, DHT11 sensor is used to get the temperature and humidity readings. The DS18B20 sensor probe is used to get the soil temperature and a soil moisture sensor is used to read the Soil moisture so that the water pump can be turned on/off automatically.

### Adafruit IO Setup

Adafruit IO is an open data platform that allows you to aggregate, visualize, and analyze live data on the cloud. Using Adafruit IO, you can upload, display, and monitor your data over the internet, and make your project IoT-enabled. You can control motors, read sensor data, and make cool IoT applications over the internet using Adafruit IO.

To use Adafruit IO, first, you have to create an account on Adafruit IO. To do this, go to Adafruit IO website and click on 'Get started for Free' on the top right of the screen.





### III. DEFINITION IOT BASED SMART AGRICULTURE SYSTEM

IoT based SMART AGRICULTURE SYSTEM is regarded as IoT gadget focusing on Live Monitoring of Environmental data in terms of Temperature, Moisture and other types depending on the sensors integrated with it. The system provides the concept of “Plug & Sense” in which farmers can directly implement smart farming by as such putting the System on the field and getting Live Data feeds on various devices like Smart Phones, Tablets etc. and the data generated via sensors can be easily shared and viewed by agriculture consultants anywhere remotely via Cloud Computing technology integration. The system also enables analysis of various sorts of data via Big Data Analytics from time to time.

### IV. CONCLUSION

IoT based SMART FARMING SYSTEM for Live Monitoring of Temperature and Soil Moisture has been proposed using Arduino and Cloud Computing . The System has high efficiency and accuracy in fetching the live data of temperature and soil moisture. The IoT based smart farming System being proposed via this report will assist farmers in increasing the agriculture yield and take efficient care of food production as the System will always provide helping hand to farmers for getting accurate live feed of environmental temperature and soil moisture with more than 99% accurate results.

### REFERENCES

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