

# Administration of Agricultural Devices Using IoT: A Review

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## Abstract:

IOT technology plays a vital role in the field of development of agricultural. In India about 70% of the people depend on agricultural. The issues concerning agriculture have been always hindering the development of the country. To bring out solution to this problem is that smart agriculture by modernizing the current traditional methods of agriculture. So hence here we are applying the automation on IOT technology to smart agricultural.

**Keyword:** IoT technology, agricultural, ZigBee modules.

## 1. INTRODUCTION:

The traditional agriculture mainly relies on natural resources and low labor costs. As there enormous growth in technologies, farming has become more popular and significant in today's world, so we use different tools and techniques that are available for development of farming. According to the United Nation Food and Agriculture Organization (UNFAO), world will need to produce 70% more food in 2050 than it did in 2006[3]. To achieve this, the farmers and agricultural companies are turning to the Internet of Things for analytics and greater production capabilities. Internet of Things (IoT) can play versatile role in increasing of productivity, and obtaining huge global market, idea about recent trends of crops. IoT is a network of interconnected devices which can transfer the data efficiently and decreasing human contribution.

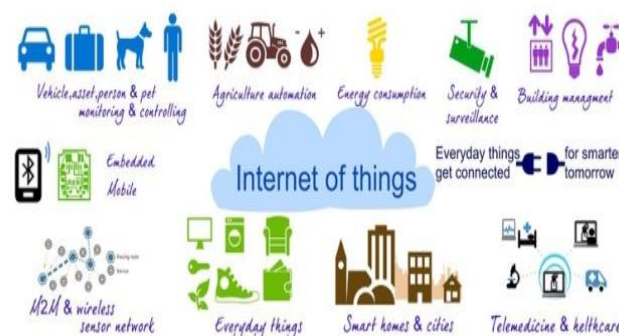


Fig 1: using IoT in various field

## 2. LITERATURE SURVEY:

The more recent situation of decreasing water tables, drying up of rivers and tanks, unpredictable environment present an pressing want of proper utilization of water. To manage up with this use of temperature and moisture sensor at appropriate places for tracking of plants is applied in. [1] after the studies in the agricultural area, researchers determined that the yield of agriculture is decreasing daily. But, use of technology in the discipline of agriculture performs crucial position in growing the manufacturing in addition to in decreasing the more man energy efforts. Some of the studies attempts are finished for betterment of farmers which gives the structures that use technology useful for growing the agricultural yield. [2]In our country many villages suffer from power shortage and they are given power supply at odd times of the day. This is a major problem for the farmers to go the farm and to provide water to the crop at the unfavorable times which is also dangerous to the farmer. Thus, there is a necessity for the automatic functioning of motor and protecting it from natural calamities. [3]

- Lack of proper land reform measures.
- Lack of credit facilities.
- Lack of fertilizer.
- Soil erosion.
- Very high dependency on monsoons.
- Inadequate irrigation facilities.

## 3. The Concept of using IoT:

Our modest attempt is to provide flexible working environment on digitalizing to the farming community which was exposed to a lot of natural calamities and digital deprive. This one stock solution provides.

- Protection to electrical appliances against storms and thunders.

- Optimal water management as per crop needs.
- Automated power management to save power bills and save energy consumption.
- Preventing night's visits of farmer to the farm.

These goals are achieved by controlling the work of motor according to the environment around it and by making the optimal use of water, power and also to protect it from different threats. IOT sensors support cooperative cultivation system, the product can be provided on subsidized price irrespective of farmer background. The device acts as the representative the farmer and performs much of his duties.

Table 1: Different tasks and applications are coordinated in Agricultural fields prompting proficient administration and controlling of different exercises.

Application Name	Description
Crop Water Management	In request to perform agribusiness exercises in proficient way, satisfactory water is fundamental. Farming IoT is coordinated with Web Map Service (WMS) and Sensor Observation Service (SOS) to guarantee appropriate water the executives for water system and thus lessens water wastage.
Precision Agriculture	High accuracy is required in terms of weather information which reduces the chances of crop damage. Agriculture IoT ensures timely delivery of real time data in terms of weather forecasting, quality of soil, cost of labor and much more to farmers.
Integrated Pest Management or Control (IPM/C)	Agriculture IoT systems assures farmers with accurate environmental data via proper live data monitoring of temperature, moisture, plant growth and level of pests so that proper care can be taken during production.
Food Production & Safety	Agriculture IoT system accurately monitors various parameters like warehouse temperature, shipping transportation management system and also integrates cloud based recording systems.

### 3.1 Moisture Sensor:

Soil wet device live the volumetrically water content within the soil. Since the direct gravimetric measurement of the free-soil moisture requires removing, drying and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using other property of the soil, like electric resistance, nonconductor constant or interaction with neutrons, as a proxy for the wet content. The relation between the measured property and soil moisture must be calibrated and may vary depending on environment factors such as soil type, temperature, or electric conductivity. Reflected microwave radiation is affected by the soil moisture and is used for sensing in hydrology and agriculture. Portable probe instrument can be used by farmers or gardeners. Soil moisture sensor measure another property of moisture in soils called water potential; these sensors are usually referred to as soil water potential sensors and include tension meters and gypsum blocks.

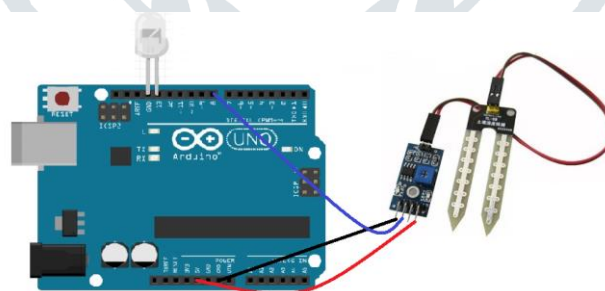


Fig 3: Moisture Sensor

### 3.2 Rain Sensor:

This module allows us measure moisture via output pins and it provides a digital output when a threshold of moisture is exceeded. The module is based on the LM393 opamp. It includes the electronics module and printed circuit board (control board) that “collects” the rain drops. As rain drops area unit collected on the card, they create paths of parallel resistance that are measured via the op amp. The lower the resistance the lower the voltage output. Alternately, the less water, the more prominent the yield voltage on the simple stick. A completely dry board for example will cause the module to output to five volts.

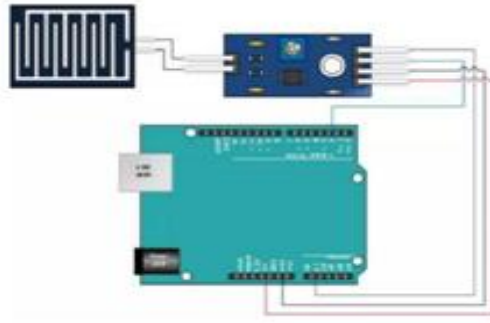


Fig 4: Rain Sensor

### 3.3 Light Dependent Resistor

A photograph resistor (or light-subordinate resistor, LDR, or photoconductive cell) is a light-controlled variable resistor. The opposition of a photograph resistor diminishes with expanding occurrence light power; as it were, it display's photoconductivity. A photograph resistor can be connected in light-touchy finder circuits, and light-and dim actuated exchanging circuits.

A photograph resistor is made of a high opposition semiconductor. In obscurity, a photograph resistor can have an obstruction as high as serval super ohms (M), while in the light, a photograph resistor can have an opposition as low as a couple of hundred ohms. In the event that episode light on a photograph resistor surpasses a specific recurrence, photons consumed by the semiconductor give bound electrons enough vitality to bounce, into the conduction band. The subsequent free electrons (and their entire accomplices) lead power, accordingly bringing down opposition. The obstruction range and affectability of aphotorresistor can generously contrast among different gadgets. Also, interesting photograph resistors may respond considerably distinctively to photons inside certain wavelength groups.



Fig 5: LDR sensor

### 3.4 Sprinklers

An Irrigation sprinkler is a gadget used to inundate agrarian yields, yards, scenes, greens, and different regions. Sprinkler water system is a technique for applying water system water which is like regular precipitation. Water is disseminated through an arrangement of channels as a rule by siphoning. It is then showered into the air through sprinklers with the goal that it separates into little water drops which tumble to the ground. The siphon, valves, circulation funnels, and sprinklers are commonly intended to apply water as consistently as would be prudent.



Fig6: sprinklers

### Description

In our thesis we want to ensure security motor protection and efficient power and water management system. Description is as follows.

- The goals are achieved by controlling motor according to environment around it there by optimizing the water and power along with threat protection.
- The rain and moisture sensors in our model are used to regulate the water management system.
- The micro controlled based model senses the abnormal voltages and activity relay system to protect motor from getting burned.

#### 4. Materials and Methods

In general the area of agriculture serves the basic analysis study for the grant given by Internal Grant Agency of Faculty of Economics and Management (FEM). Based on the current situation we analyze the IoT Technologies and its potential areas of rural development and agriculture. It follows long-term research goals; the main aim is to compile the methodologies and approaches, the most important terms of project solution are: - defining and evaluating selected platforms suitable for use in IoT Technologies. Utilize of various methods these represent a broad view upon the dynamic developing field of IoT results should fill the information gaps in this area. Research is primary focused on analyzing currently used methods and tools in IoT for data transfer and processing in agricultural sector. Experimental evaluation can test the particular impact of problematic issues for purposes of usage in agriculture. Main practical benefit of this research will be feel emphythy technological and technical limitations of IoT based on evaluation of actual real world.



Fig 7: Method of solution

#### 5. Smart Agriculture Using IOT

India's Economical growth is purely depends on Agriculture .In traditional farming the most important barrier that arises in the change of climate. The effects of changes in the climate include heavy rainfall, most intense storm and heat waves, less rainfall etc. Due to the productivity decreases to major extent. The changes in climate also raise the environmental issues such as seasonal changes in life cycle of plants. To improve the productivity and minimize the barriers in agriculture field, there is need to use innovative technology and techniques called Internet of Things. Today's, the Internet of Things

(IoT) is transforming towards agriculture industry and enabling farmers to compete with the enormous challenges they face. Farmers will get to know full information and knowledge about the recent trends by using IoT.



Fig 8: Monitoring in Agriculture by using IoT device

**The Key Advantages of Using IoT In Enhancing Farming Are As Follows:**

Table 2

Year	Data Analysis
2000	525 Million Farms connected to IoT
2016	540 Million Farms till Date are connected to IoT
2035	780 Million Farms would be connected to IoT

## 6. Conclusion

Farming will play a key role in the next few years in our country. So, there is need of smart farming. Internet of Things could help to enhance smart farming. IoT works in various domains of farming to improve the time efficiency, water management, crop monitoring, soil management, control of insecticides and pesticides etc. It also minimizes human efforts, simplifies techniques of farming and helps to gain smart farming. Along with these features smart farming will help to grow the market for farmer with single touch and minimum efforts.

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