# Smart Farming Using IOT

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*Abstract- Automation of farm activities can transform agricultural domain from being manual and static to intelligent and dynamic leading to higher production with lesser human supervision. The project describes how irrigation can be handled smartly using IOT. This project aims at saving time and avoiding problems like constant vigilance. It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. This system can also prove to be helpful in agriculture, parks and lawns. The objective of this system is to detect the moisture content of the soil and depending on it sprinkle water. The following implementation procedure of Farm Automation with IOT application, Watering, temperature measuring, Ph value measuring to identify the soils condition, provide light for photoconductivity through LDR, 24-hour automatic monitoring, Collecting and sending data to the users, easy to operate. The main goal of this project is to create a new Agricultural revolution by using technology.*

*Indexed Terms- IOT (internet of things), GSM (global system for mobile), Arduino, different type of sensors.*

## I. INTRODUCTION

In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere.

IoT-based smart farming is highly efficient when compared with the conventional approach. Automation of farm activities can transform agricultural domain from being manual and static to intelligent and dynamic leading to higher production with lesser human supervision.

It also helps in conserving water by automatically providing water to the plants/field depending on the water requirements. This system can also prove to be helpful in agriculture, parks and lawns.

The biggest problem faced during production of crops, leading to wastage or below par production is non timely watering in the field or inaccurate amount of water being poured in the field. At times, due to the human tendency, either greater or lesser amount of water is allowed to enter the field thereby destroying the crop.

This marks the first major problem. Also, water-level in the source tank sometimes goes low or sometimes get over-drained. Thus, information regarding scarcity or abundance of water in the reservoir is the second major problem.

The basic aim in this field is to maximize the yield by intelligent and efficient use of the available resources which are generally limited and scarce costly. Hence it becomes really important to use them significantly. There are many factors which affect the crops, including weather and climatic conditions, lay of the land, soil parameters, etc.
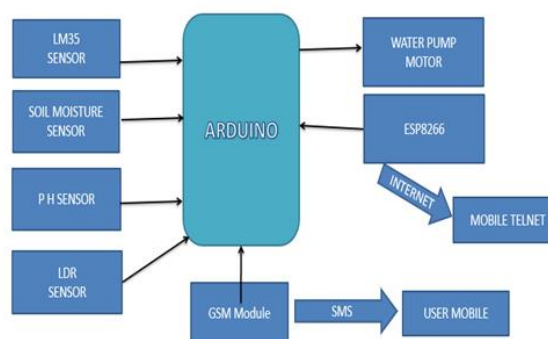


Fig. 1. Block diagram of smart farming using IOT

## II. LITERATURE SURVEY

In sensor based smart farming using IOT mentioned

above sensor-based farming in which the farming will take place whenever there is a change in a temperature and also the humidity of the surroundings.

In this smart farming using IoT system we providing farmer which acts as a user an easier way for doing farming with this smart technology with doing lot of works. Some of them are plucking the seeds, spraying of the fertilizers, water sprinkling. etc.

In already existing farming, farmer who acts as a user do lot of work but our proposed system can reduce the farmers effort and helps in performing the farming in easier and most efficient way.

### III. EXISTING SYSTEM

In the existing system the farmer have to monitor the fields with a man power by spending all his efforts in the fields, and he can produce for a limited production of crop in the market. And also spend a lot of time in the field to produce a good crop.

The crop without insecticides and plucking weeds in crop or field, spraying the chemical fertilizers that may cause slow poisoned attacks like lungs infection and an allergies on skin etc… health issues will come for some farmers. For all these problems we have proposed a system by using the fore coming technology in world IOT.

### IV. PROPOSED SYSTEM

By the proposed system the farmer need not want to spend the more man power in the fields, and he can try different types of crops and produce a more crop in market place and get a good profit for his price.

This proposed system is like a brother, helps in a tough situation for the farmer in the field work. This device works 50% what farmer can do and it is a most helpful in farming different conditions of environment and in a particular situation. It gives the alert messages to farmer what device sense in the field.
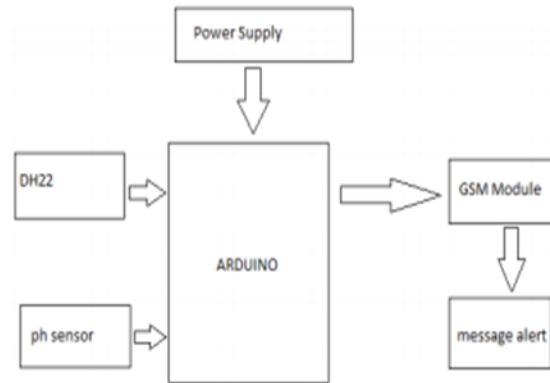


Fig. 2. Block diagram of proposed system

Advantages of proposed system:
- It allows farmers to maximize crop production using minimum resource such as water, fertilizers, seeds.
- We can also save cost of electricity.
- Smart agriculture use drones and robots which helps in many ways.
- It can produce high quality crop production.

### V. MODULES

There are 3 types of modules we have:
Field unit
Sensor info unit
Farmer unit

Field unit:
It is an automatic smart farming device, working of this module is automatic whenever a cause occur the device will work according to that cause using the micro controller i.e; Arduino UNO. In this unit we have all types of the sensors or the components that sense the cause and analyze.

Sensor info unit:

In this module all the data regarding the sensors will be available analyzed by the sensors. This unit is very crucial in the total modules

Farmer unit:

Farmer is a user. User gets the SMS alerts and messages regarding the work done by the device in the field.
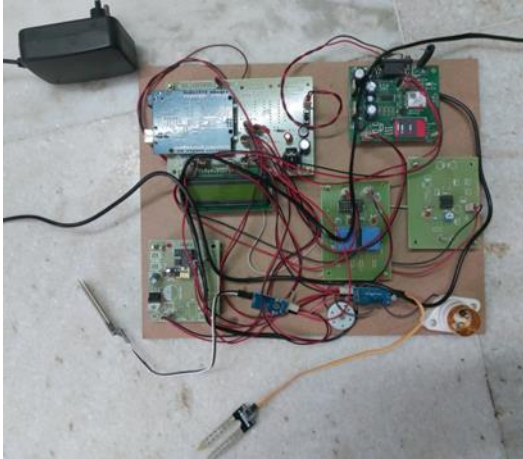


## VI. WORKING

In this working we have different steps to follow they are:

- In this working of a system, first we have to set up the system as per our requirements.
- Next step is to assign some threshold value to the system.
- Then we have to get the data from the different sensors that we used in this project.
- Next step is, we have to process the data.
- Appropriate actions are taken as per our system requirements.
- Message has been sent to the farmer mobile by using GSM module.
- Finally, we have to reset the threshold values to the system.
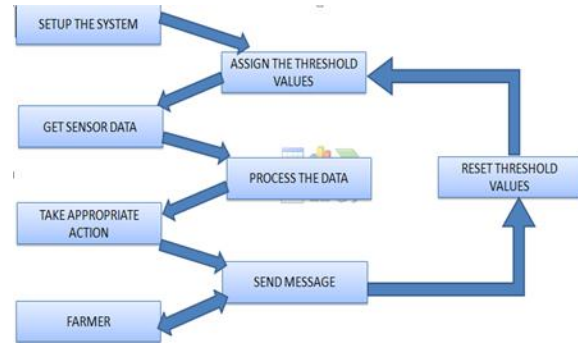


## VII. EXPERIMENTAL RESULTS AND ANALYSIS

In this system we worked on different test cases with different conditions such as when we coming to temperature, we got different readings. and coming to moisture condition we get some times dry and sometimes we get wet.

Coming to LDR screen sometimes we got light and sometimes we got dark. Water pump motor has some times on and off.

Here some of the different outcomes that we got by executing the system. they are:
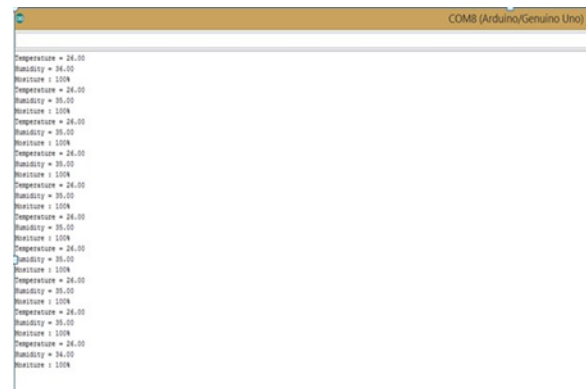


## VIII. SOME OF THE TEST CASES ARE GIVEN BELOW

Test case-1:

In this test case, temperature reading will be 33c, moisture condition is wet, light will be dark, PH value is 0 and motor pump is off…

Test case-2:

In this test case, temperature reading will be 31c, moisture condition is dry, light will be light, PH value is 0 and motor pump is on…



Test Case-3:

In this test case, temperature reading will be 33c, moisture condition is wet, light will be light and PH value is 0, motor pump is off…



CONCLUSION

Farmers are those people who work day and night under the bright sun during summer, under cloud and rain during rainy season. They don't have any vacation. Each season they have to cultivate something.

Question comes why they do it though they are not paid enough money? They do it just to make sufficient food for us. They do it for the people of their country. They do it out of responsibility and love towards their country.

Now it is time for us to do something for those hard-working people because of whom we can eat at least three times a day and fulfill the need of our stomach. In our project, we are using the science and technology to make farming easier and enjoyable.

FUTURE WORK

In future, we have the plan to overcome the limitations and add some new features to our project so that the general people of our country can get the benefit of happy farming. Some of the extensions that we would like to add in future are discussed briefly below.

Rooftop Gardening: We can easily set the system in the rooftop of the city buildings to increase the greenery.

Greenhouse: We have the plan to implement the system in greenhouse. If we can make it to the greenhouse, the agricultural system of the colder countries will be more improved.

Moving System: By making the system able of moving, the efficiency can be increased greatly because moving automated system will have the scope to cover larger area without any boundary limitations. Immune to harsh weather: Improving the protection system of our project can make it resistive to harsh weather so that it can function normally in the rain, storm etc.

BI Intelligence survey expects that the adoption of IoT devices in the agriculture industry will reach 75 million in 2020, growing 20% annually. At the same

time, the global smart agriculture market size is expected to triple by 2025, reaching $15.3 billion.

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