



# Smart Field Inspection Using Arduino

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**Abstract :** The goal of this project is to create a smart agriculture system that takes care of the agricultural field from wild animals. Also, the purpose of this study is to design a system that can monitor temperature, humidity, moisture, and even the movement of animals that may harm the crops in agricultural fields using various sensors and sending alerts, if there is a problem. Smart agriculture is a new concept because sensors are used to provide information about agriculture fields and then act on it based on user input. The project's goal is to employ emerging technologies such as Arduino to automate smart agriculture. Environmental monitoring is a key aspect in increasing the production of efficient crops. In this project, an alert SMS will be sent to the owner in case any wild animal enters the field.

**IndexTerms – Arduino, GSM, Smart field**

## INTRODUCTION

India is a predominantly agricultural nation. Farmers water their lands manually at regular times nowadays. Many agricultural fields require real-time temperature and humidity monitoring. The previous way of wired detection control, on the other hand, is inflexible, resulting in a number of application difficulties. As a critical solution to this problem, this project achieves irrigation automation. This is accomplished with the help of an Arduino, which uses the input to regulate the moisture and temperature sensors.

For this aim, moisture sensors are utilized. Our project's major goal is to simplify supervision and eliminate the need for continual monitoring. The soil moisture sensor is inserted into the soil to identify whether it is wet or dry. The relay unit connected to the motor switch must be checked on a regular basis if the soil moisture level is low. It will switch on the motor when the soil is dry and it will turn off the motor when the soil is damp.

The initiative of the project is mainly focused on the following aspects:

- Monitoring the system
- Security of the system

**Objective:**

- To protect the crops by giving a warning to the field owner
- Various sensors are used to monitor the field
- To protect the crops by diverting the animals without harming them



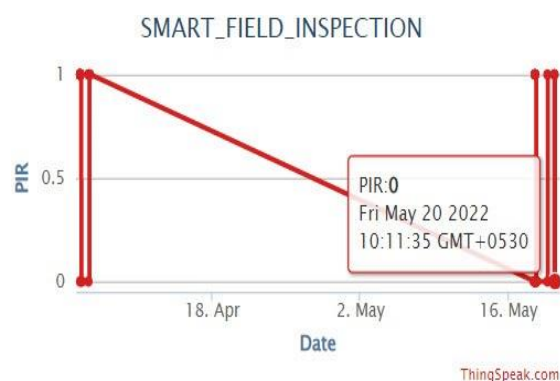
Fig.1 Flowchart

## RESEARCH METHODOLOGY

The task was divided into three parts to make it easy to understand. Firstly, the PIR sensor checks if any animal is detected or not, and the feedback is sent to the LCD display. Secondly, the DHT11 sensor checks the temperature and humidity values and the water level sensor checks the water level. And those will be sent to the LCD display. Lastly, all this data will be sent sequentially to the mobile number through SMS from the GSM module. This process will be repeated continuously after several intervals of time. When the moisture level gets reduced by more than a certain expected value, the motor will start automatically. All this data will be uploaded to ThingSpeak cloud storage too.

## RESULTS AND DISCUSSION

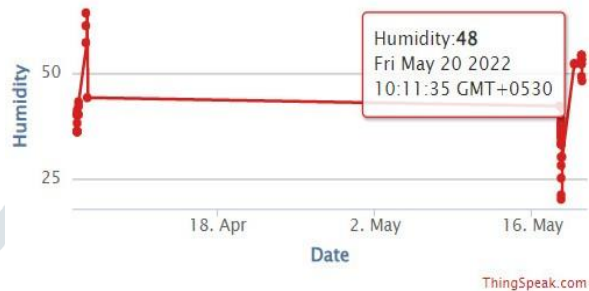
We have used different types of sensors. The result data from the sensors is displayed on the LCD display. The server also stores the data from the sensors. The data is sent to the mobile number through SMS using the GSM module. As all the information is delivered to the user's mobile phone, the user will react accordingly. The system delivers an alert message to the user whenever a wild animal is spotted by the PIR sensor. For measuring the amount of moisture in the soil, we employed a soil moisture sensor. If there is insufficient moisture in the soil, the motor will start.



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# CONCLUSION

The main objective of the project is to build a smart field that would run with the help of data obtained from different sensors. Micro-controller ATmega328 is used in this project. The PIR sensor detects if any wild animal enters the field and an alert is sent to the user. The soil moisture sensor is used to detect the amount of moisture in the soil and if there is insufficient moisture then the motor will start. The ATmega328 Arduino UNO is used to process the data and this data is displayed on the LCD display. The water level is detected by using a water level sensor. The temperature and humidity are measured with the help of the DHT11 sensor. All this data is sent to the user via SMS by using the GSM module. Also, this data is stored on the server for future reference.

# REFERENCES

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