

# SMART FARMING

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**Abstract**— Agriculture is the widest economic sector and plays an important role in the economic development of a nation. Technological advancements in the area of agriculture was certain to increase the competence of certain farming activities. In this paper we have proposed a prediction mechanism in order to increase the yield with the limited supply of water and we are using the moisture sensors, in order to measure the moisture content of the soil. The water pump is used to supply water to the plants. It can be controlled by interfacing it to the arduino board. The moisture sensors measure the water content of the different plants. If the moisture level is below the desired level, the moisture sensor sends the signal to the Arduino board which triggers the Water Pump to turn ON and supply the water to respective plant using the Rotating Sprinkler.

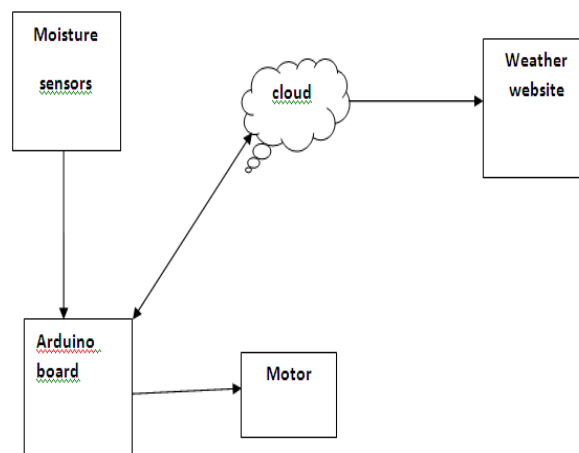
**Index Terms**— Moisture sensor, cloud, Motor, rotating sprinkler.

## I. INTRODUCTION

Agriculture is considered as the basis of life for the human species .It plays vital role in the growth of country's economy. Unfortunately, many farmers still use the traditional methods of farming which results in low yielding of crops and fruits. The Food and Agricultural Organization of the UN (FAO) predicts that the global population will reach 8 billion people by 2025 and 9.6 billion people by 2050. In order to keep pace, food production must increase up to 70 percent by 2050. Automation had been implemented and human beings had been replaced by automatic machineries, the yield has been improved. Initially we get the information from the moisture sensor and convert the analog values to digital values and send it to the cloud via the cloud gate way. From cloud it is sent to the arduino board. We need to assign the MAC address so that the IP address will be assigned automatically. So with the help of these two we are able to connect it with

the cloud .once all the data from the sensors and from the weather webpage reach the cloud and the analysis had been done. After the analysis had been carried out at the cloud the data has been send to the arduino. Here the values should be compared with the threshold value. According to it either the water sprinkler is turned on or remains off.

## II. BLOCK DIAGRAM



## III. MOISTURE SENSOR TO ARDUINO

Measuring soil moisture is important for agricultural applications to help farmers manage their irrigation systems more efficiently. Knowing the exact soil moisture conditions on their fields, not only are farmers able to generally use less water to grow a crop. They are also able to increase yields and the quality of the crop by improved management of soil

moisture during critical plant growth stages. The data collected by the soil moisture sensors inserted in the soil are sent to the arduino which converting the analog information to digital information as shown in Fig. It emphasis on Real Time Client-Server model in which the data is extracted in an automatic manner and placed in the big data .

#### IV. ARDUINO TO CLOUD

At first we need to assign MAC address and IP address to the arduino so that it can communicate with other devices through wifi. The software has built in DHCP support, and does not require manually configuring an IPaddress.

To figure out what IP address has been assigned to your board, open the Dhcp Address Printer sketch. Once open, you may need to change the Mac address. On newer versions of the Ethernet shield, you should see this address on a sticker attached to the board. If you are missing a sticker, simply making up a unique mac address should work. If you are using multiple shields, make sure each has a unique mac address. Once the mac address is properly configured, upload the sketch to your Arduino, and open the serial monitor. It should print out the IP address in use.

#### V.WEATHER WEBPAGE TO CLOUD

The weather webpage contains the information about the climate for next two days. This information can be interface with the cloud in order to make the prediction.

#### VI. WEATER FORECAST

A HTTP Connection is made to the Open Weather Map over WiFi/ GPRS which queries the data from servers. The data which the client gets regarding forecast is in the Extensible Markup Language (XML) and Java Script Object Notation (JSON) formats. XML provides a language which can be used between platforms and programming languages and still it can express complex messages and functions. JSON is used to transmit human readable text consisting of attribute-value pairs between a server and web application. User

can search based on current GPS location or directly by city name; the 5 days' forecast includes information about – weather type, image, min-max temperature are available in the app. Then we must also trigger the water sprinkler checking the above conditions.

#### VII. LITERATURE SURVEY

The newer scenario of decreasing water tables, drying up of rivers and tanks, unpredictable environment present an urgent need of proper utilization of water. To cope up with this use of moisture sensor at suitable locations for monitoring of crops is implemented in.

An algorithm developed with threshold values of temperature and soil moisture can be programmed into an arduino-based gateway to control water quantity.

A remote sensing and control irrigation system using distributed wireless sensor network to maximize the productivity with minimal use of water was developed by Y. Kim. Cloud storage is a cloud computing model in which data is stored on remote servers accessed from the Internet, or "cloud." It is maintained, operated and managed by a cloud storage service provider on storage servers that are built on virtualization techniques.

Cloud storage is also known as utility storage - a term subject to differentiation based on actual implementation and service delivery

#### VIII. RESULTS OBTAINED

Wireless sensor network collects soil moisture and transmits the data to cloud. In cloud the data is interpreted, manipulated and commands to irrigation water valves are issued based on the water requirements.

The wireless valve is actuated to supply water. This opportunity for making farming smarter can increase yields and profits and reduce the use of precious water. Smart farming is also an opportunity in cities. In urban areas, lack of vacant plots of land is driving more and more urban farmers to produce food upwards on the side of buildings rather than outwards.

#### IX.CONCLUSION

Thus we have proposed a prediction mechanism in order to increase the yield with the limited supply of water and we are using the moisture sensors, in order to measure the moisture content of the soil. The water pump is used to supply water to the plants. It can be controlled by interfacing it to the arduino board.The

moisture sensors measure the water content of the different plants. If the moisture level is below the desired level, the moisture sensor sends the signal to the Arduino board which triggers the Water Pump to turn ON and supply the water to respective plant using the Rotating Sprinkler.

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