Parameter Monitoring Smart Agriculture

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Abstract- *With over decade of intensive research wireless sensor network technology has become a powerful tool to many innovative application. The project aims towards providing platform of analyzing and exchanging data automatically in agriculture field to farmers. In this paper wireless sensor network system that we have developed using open source hardware platform Arduino and raspberry pi is described. The natural parameters like soil moisture, humidity, temperature, wind speed will be sensed through various sensors. The sensed data then given to Arduino and further sends to raspberry pi kit. Raspberry pi then analyzed data and update parameter to pc. The parameters can also be analyzed through internet using various applications.*

Keywords- Arduino, Raspberry pi, Sensor, Temperature.

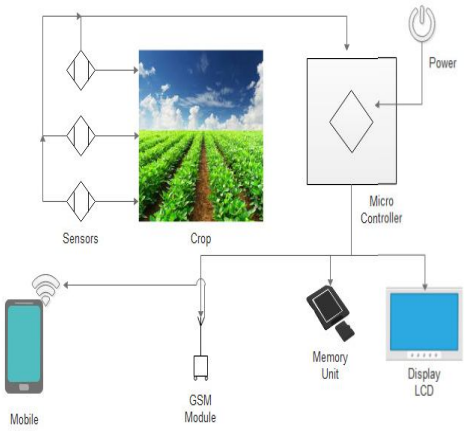
I. INTRODUCTION

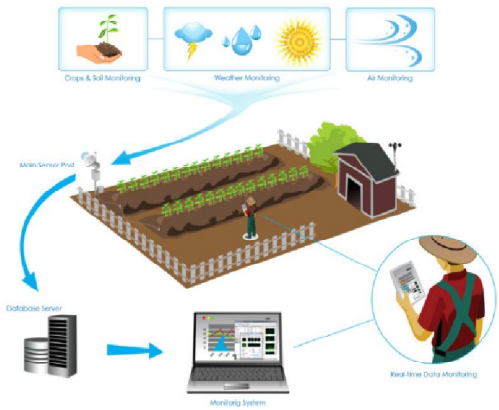
Agriculture is the backbone of indian economy. Almost two third of the population is dependent on agriculture. Agriculture plays an important role in indian GDP. All classical farming methods has become outdated now. In classical methods, farmers need to visit the field regularly so as to check different parameters and growth of the crops. This paper focuses on online monitoring of agricultural parameters like soil moisture, temperature, humidity, wind speed. All these parameters are sensed by different sensors .These sensors are sensed data and send it to Arduino. This data is applied to WIFI module transmitter. All these together called as field side. In client side, receiver WIFI module collects the data send by transmitter WIFI module. This is further connected to raspberry pi .Raspberry provides GUI interface to pc. The pc i8s connected to cloud. This is the real time monitoring of parameters. The ability to monitor environmental condition is crucial to research in field ranging from climate variability to agriculture .This work structured the precision agriculture monitoring system by wireless sensor nodes to record the data. The designed system is cost effective. This kind of wireless detection and control improve the effectiveness and efficiency of resources used which leads to improved production.

II. LITERATURE REVIEW

1.Review paper 1

This research paper consists of measurement of temperature, contify the water level estimate the light intensity,sense air toxicity ,display the sensor readings on the LCD screen ,allow user to modify the optimal values for t6he sensor, Respond to sensor reading and send s alert to the user.This system consists of wide range of sensor. The system also includes an air toxicity sensor. Arduino mega development kit contained the microcontroller inbuild and helps us to integrate all the sensors and display the sensor reading on the LCD screen.It also has memory unit to save the data. Furthermore, this touch LCD screen can also act as an input device. User interface is used to take the input from the touch the LCD. Also it has WIFI module which sends thec sensor reading to the server .

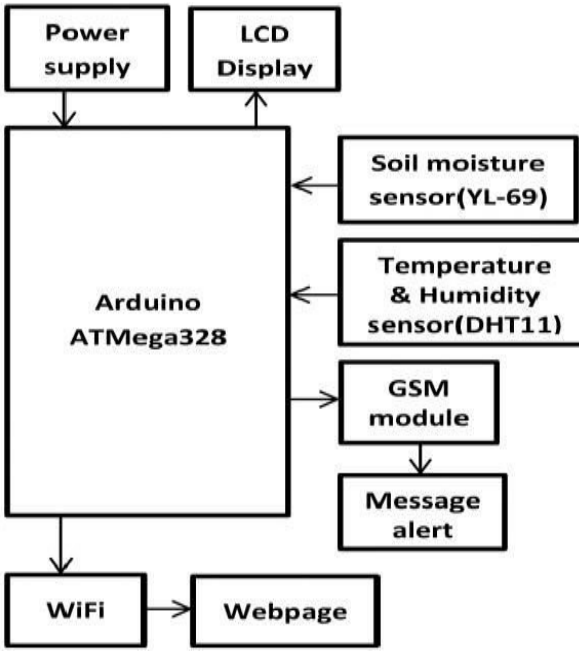




2.Review paper 2

The paper aims to look at all the problems like bad crop or crop failure to find the solution .Since IOT is an emerging field and its applications are wide , the paper has included an application iot in agriculture as well. The paper aims at helping the farmer by providing data such as air temperature and humidity , soil temperature and moisture , through sensors ,which is send on the website, through Arduino microcontroller which uses ATMEGA328 on chip, on which the farmer can easily see. The sensors will extract the analog data from soil and air. This data will them converted in digital form through an ADC which will then be send by the website.

An automatic water pump connected through a relay added to the water the crops automatically thus reducing the work of the fiber. A PIR sensor senses an animal instruction and lets the farmer know through an SMS via GSM, thus saving his crop .

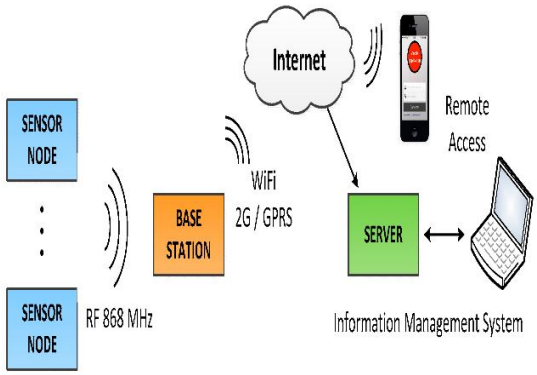


3.Review paper 3

The project aims at making agriculture smart using automation and IOT technology. The highlighting features of this project includes smart GPS based remote control robot to perform task like weeding, spraying, moisture sensing ,bird and animal scaling, keeping vigilance, etc. secondly, it includes smart irrigation with smart control and intelligent decision making base on accurate real time field data. Thirdly, smart warehouse management which includes temperature maintainance, humidity maintainance and theft detection in the warehouse .Controlling of all these operations will be through any remote smart device or computer connected to the internet and the operations will be performed by interfacing sensors,WIFI and ZIGBEE sensor , camera and microcontroller and raspberry pi.

4.Review paper 4

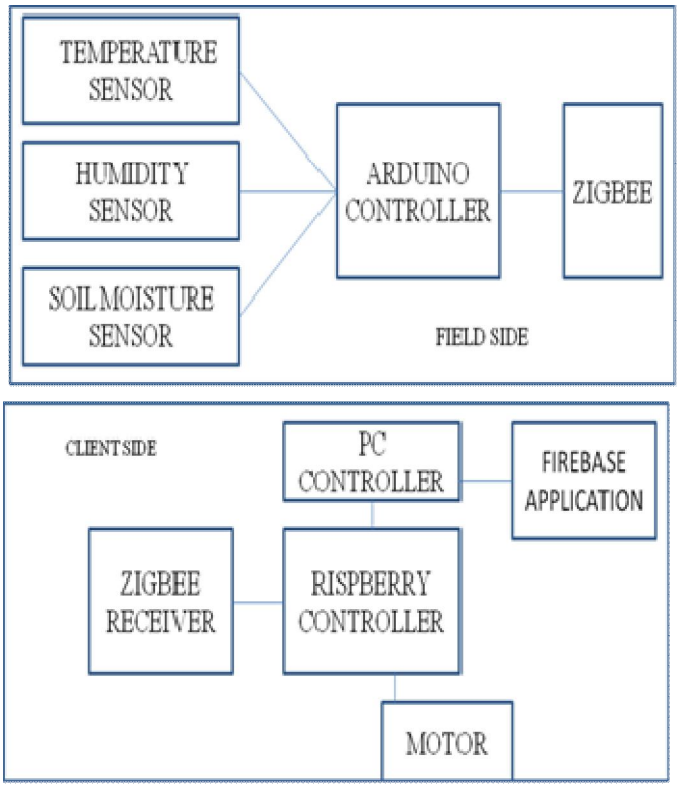
The basic idea is making multiple nodes which are connected to base station.Each node consists of sensor unit with microcontroller unit and ZIGBEE module.These nodes are connected to base station.The Base station is connected to router .The pc which are directly connected to router can gain data from router itself and router is also connected to internet.so,pcs which are using intermet can also gain and transfer data through router coming from base station.



III. METHODOLOGY

The actual method consists of two main groups.One is field side part and other is client side part.The field side consists of temperature sensor(DHT11),Humidity sensor(DHT11),Water level sensor(SHT10),wind speed sensor which are present in the farm.These hardware circuit part in the field senses the parameters.The arduino senses the values from all those sensors.The arduino sends its data to raspbeery pi which is and ZIGBEE receiver is placed in client side.Hence,The communication of Arduino with Raspberry pi is possible.ZIGBEE is basically simpler and cost effective then WIFI module.ZIGBEE is basically a protocol which we use for wireless communication.The raspberry pi module is further connected to pc screen.Further,It is possible to upload data to internet by using either firebase application or any other application.(firebase application is basically google mobile platform that helps us quickly develop high quality apps and it gives functionality like analytics, databases,

messaging and crash reporting so we can move quickly and focus on users).



IV. CONCLUSION

The design system was implemented with reasonable number of features.The system was realized using Arduino and raspberry pi module.Sensors like temperature , humidity and soil moisture were interfaced so as to take readings.The arduino is responsible for obtaining data and sending data to raspberry pi over its serial port.Raspberry pi accepts data and displays it on pc.Further,it pushes data over the internet to a real time database service .The system was configured to update the online database .Apart from very few skips,it is possible to build a system which can work smoothly and ready to implement in the field.

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