Monitoring And Controlling Of Agriculture System Using IOT

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Abstract—Agriculture plays a vital role in Indian economy and is backbone of economic development of a nation. Tasks like weeding, spraying, moisture sensing, bird and animal scaring, are kept under vigilance using wireless network sensors to connect multiple sensors data. we have proposed a novel methodology for smart farming by linking a smart sensing system through wireless communication technology. operations will be through any smart mobile or computer connected to Internet by interfacing sensors the operations will be performed. Compared to other wireless computing techniques this method has faster updating capability.

Keywords—Smart Sensing, IOT, Sensing system, Agriculture system.

I.INTRODUCTION

Many people in different parts of the world made agriculture as their main source of livelihood. There is a need for increased agricultural production with increasing population all over the world. It is the most important occupation of many families in India. The requirement of the amount of fresh water used in irrigation raised in order to support greater production in farms. Currently, agriculture accounts 93 of the total water consumption in India. There is a lot of water wastage due to unplanned water usage. Unfortunately, farmers today are yet using those traditional techniques that have evolved hundreds of years ago. Due to this the yield of crops are becoming low. Also, there are a number of factors that contribute to the low yield of crops such as proper soil preparation, seed rate, different sowing time, lack of moisture in the fields, water logging and salinity, lack of application of fertilizers, plant protection, adoption of modern technologies, improper marketing and lack of investments. The major problem faced in many agricultural areas is that lack of mechanization in agriculture activities. our smart farming system reduces the manual work and automates the agricultural activities[1]. The farm irrigation systems in the previous irrespective of the weather conditions or moisture content present in the soil. Labor cost can be significantly reduced and crop yield can be increased by incorporating various advanced sensing and controlling techniques. But the complex design and cost of this technique is the major drawback to fit in the cultivation land[2]. Therefore, a necessity for wireless technologies and automation in agriculture farming is required. The crop yield has improved significantly by many wireless technologies used in agriculture field, some of them are remote sensing[3], global positioning system and geographical information system. A wireless network, in which various sensors are interconnected to monitor and is a Wireless Sensor Network (WSN).

II.RELATED WORK

In [1], an automated irrigation system using a WSN and GPRS module in which an algorithm was developed with different threshold values to control various parameters.
In[2],a novel of new agriculture monitoring system based on WSNs.
In[3], a novel cloud computing based smart farming system was proposed for early detection of borer insects in tomatoes. This problem was solved using cloud computing and IOT.
In[4], A networked embedded greenhouse monitoring and control based on simple embedded web servers and connecting sensors and actuators using 1-wire protocol.
In[5], design of greenhouse monitoring and controlling is a complete system designed to monitor and control the humidity inside a green house. It uses an android mobile phone, connected using Wi-Fi to a central server which connects via serial communication to a microcontroller and humidity sensor .
In[6], the design and implementation of a prototype system which integrates various existing technologies for home monitoring and control that fits with the future smart home concept.

III. PROPOSED SYSTEM

Hardware and software combinedly make a system. The programming microcontroller AT-mega328 shown in fig:1, is a hardware part which is used to connect to other sensors to collect the data. Solar panel is to be connected as a rechargeable power source to save the power, which act as renewable source of energy. An intimation could be sent to the farmers through web browser or GSM module about the moisture status (dry or wet).

Fig: 1 – AT-mega328

Using thinspeak the farmers can then take a necessary action, turning ON/OFF centrifugal pump from anywhere. Thing speak is the webpage designed using PHP. The webpage is hosted online and consists of a database in which readings from sensors are inserted using the hardware. soil moisture sensors along with LM38 comparator modules were placed in different soil conditions for analysis. It reads the moisture content around it[4]. A current is passed across the electrodes through the soil and the resistance to is made the current in the soil determines the soil moisture. If the soil has more water, resistance will be low and thus more current will pass through. An Intelligent IOT Based Automated Agriculture as shown in figure:2 , has been proposed so as to reduce the wastage of water and security to the crops. The system mainly monitors the behavior of soil moisture, air humidity, air temperature and secure the crops from animal attack and see how it contributes to evaluate the needs of water in a plant. The data is taken from the sensors and is transferred through internet to the mobile application or web app and water pump turn ON/OFF using web app.

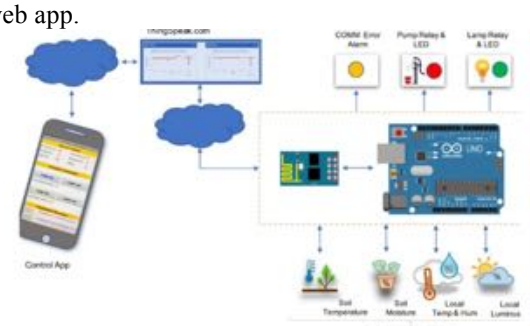

Fig:2-Smart Agriculture system

Which also includes temperature maintenance, humidity maintenance and weather reports. Controlling of all these operations will be through any smart phone will be performed by interfacing sensors. The WI-FI module that could be interconnected with the moisture sensor at various nodes of node A and node B. This collects the data continuously [5].
online portal using thingspeak software. The major advantage of this method is secured and maintained complete data for farmers convenience.

IV.ANALYSIS AND RESULTS

After analyzing the problems analyzed by farmers discussed in the related works section, we started making use smart farming techniques, which could overcome all above problems faced in farming.to overcome the knowledge deficit problem of not knowing the exact soil moisture contents. In fig 1 Monitored data from thermo hygro sensor and same in fig.3,4 and 5 by humidity sensor and soil moisture sensor.

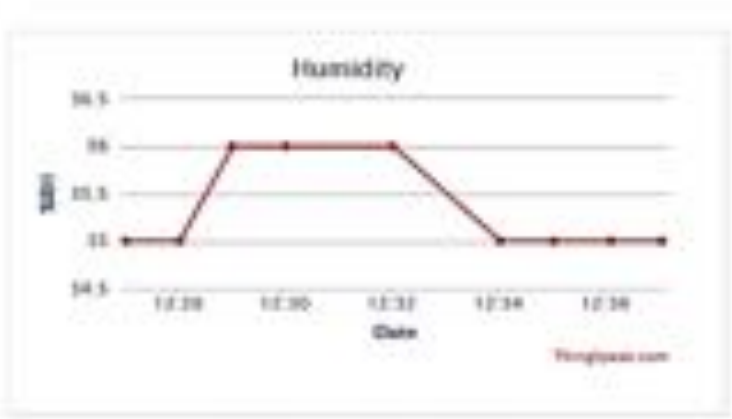

Fig:3-Relative humidity

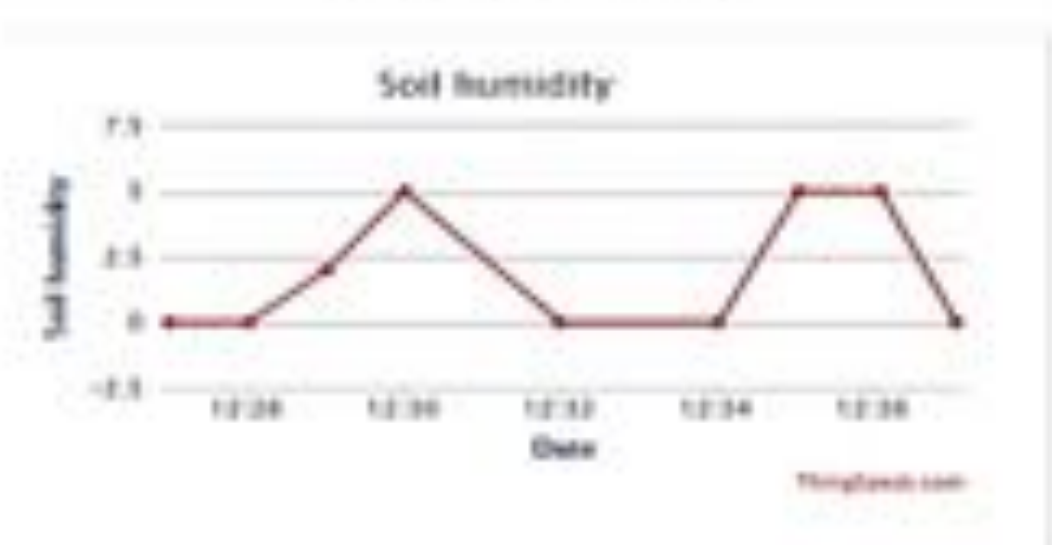

Fig:4-Soil Moisture

Fig:5- Air Temperature

V.CONCLUSION

This proposed method is very much helpful for the farmers to monitor and evaluate the needs of water in field. The proposed system monitors the air temperature, humidity and soil moisture, it compares the actual values with the threshold and gives an information to farmer about the weather condition, farm condition. Farmer gets a notification based on this and he decides whether or not to ON/OFF pump etc.

This system has a web application through which the farmer can select the type of crop from the drop-down list. This moreover a SMS system can be created if there is a failure in internet access. The farmer can get the SMS and take decision pertaining the farming. All the data is saved and can be viewed at any point of time.

VI. REFERENCES

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