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WIRELESS AUTOMATIC IRRIGATION USING IOT

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Abstract—The smart agriculture monitoring system is an emerging concept, because IOT & sensors are capable of providing information about agricultural fields and then act based on the user input. In this paper, it is proposed to develop a Smart agriculture system that aims at making use of evolving technology i.e IOT and smart agriculture using automation .Monitoring environmental conditions is the major factor to improve yield of the efficient crops .The feature of this paper includes development of a system which can monitor temperature, moisture, light intensity in agricultural fields. The parameter values will be detected with the help of sensor using Arduino board and in case of any discrepancy send a notification on the application developed for the farmer's smartphone. In this project we use different sensors, such as temperature sensor, humidity sensor, light sensor and WSN. All the parameter values are send as a notification to the farmer. It shows all parameter changes. Farmer sets some threshold level. When the threshold value get changes then the farmer can make the motor ON for irrigation.

Keywords— IOT, Agriculture, Sensor, Arduino, WSN

I. INTRODUCTION

Agriculture is the strength of Indian Economy. Agriculture water consumption is more than rainfall every year. Improving farm yield is essential to meet the rapidly growing demand of food for population growth across the world .Developing IOT technologies can help to collect large amount of ecological and crop recital data. India has agriculture as its primary occupation. According to IBEF (India Brand Equity Foundation), 58% of the people living in rural areas in India are dependent on agriculture. As per the Central Statistics Office 2nd advised estimate, the contribution of agriculture to the Gross Value Addition (India) is estimated to be roughly around 8% which is very significant contribution.

II. LITERATURE SURVEY

A. Existing system

Monitoring effect of air pollution on agriculture using WSN. Smart drip irrigation system for sustainable agriculture[1]. In this existing system a person have to monitor the physical parameters and will take further steps. We can't do anything when the animal come into the field. They will destroy the crops in the agricultural fields. Sometimes it leads to the death of the person who is monitoring everything. The human intervention was high. It is not possible to monitor and control the parameters all the time. Depending upon the climate the farmer takes more time for monitoring the parameters

B. Disadvantages

- Human intervention is not reduced
- Excess use of water for plants
- Time consumption is high
- Provide low efficiency

II. PROPOSED SYSTEM

The development of a smart agriculture system using sensors, microcontrollers[2] within an IOT system is presented[3]. The aim of the implementation is to demonstrate the smart and intelligent capabilities of the microcontroller to allow the decisions to be taken on watering the plants based on the continuous monitoring of the environmental conditions in the field. A person to continuously guard the fields at all the times which will not be accurate and the productivity of one person is wasted. This can be overcome by this system which has different sensors to detect the different parameters in the fields and send notifications to the farmer[5]. In this project we use different sensors to measure the temperature, humidity, moisture and light intensity. Automated agriculture system finds the moisture sensor and the water motor is ON or OFF depends on its threshold value. The light sensor is used to find the intensity changes and the lights in the field will be ON or OFF based on the light sensor. Automated system definitely helps the farmers in increasing the yield in the farm. Here we can save water through this project[4]. Smart irrigation system reduces human intervention. Allows remote monitoring on the android phone. Controlled amounts of water to plants at needed intervals is the main objective of this project.

III. BLOCK DIAGRAM

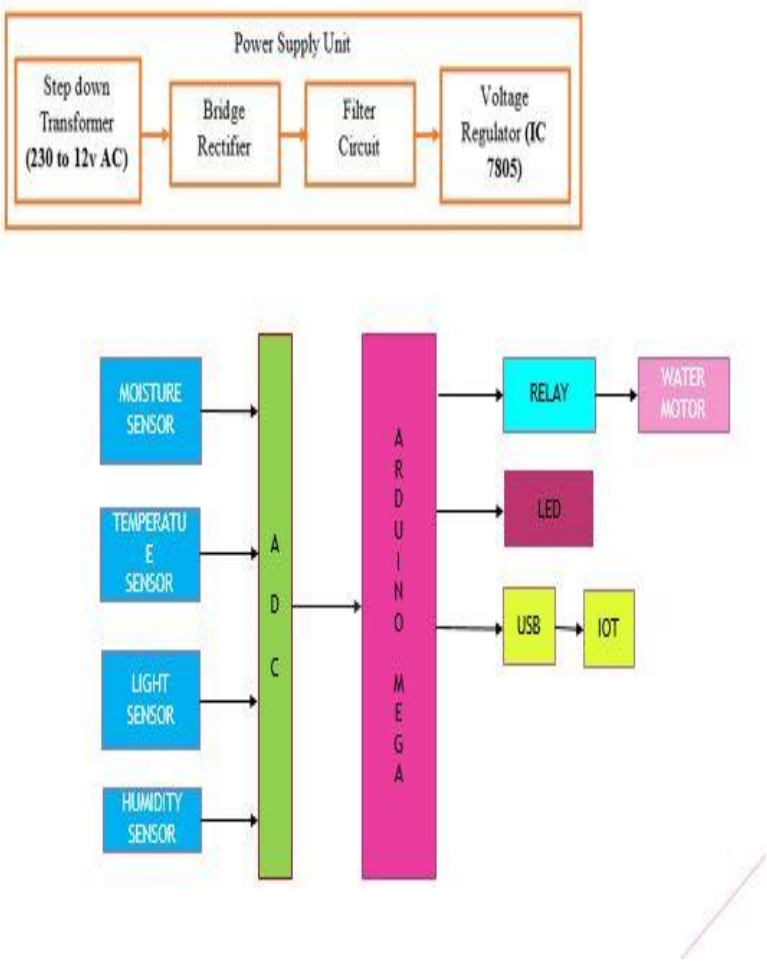

Fig 4.1 Block diagram

IV. MATERIAL AND METHOD

A. wireless sensor network

Wireless network refers to the technology to communicate and access the internet without cable connection between computers and other electronic devices.WSN can cut down the effort and time needed for monitoring environment. As a result , time, money ,water and labor costs can be reduced .The technology allows for remote measurements such as temperature ,humidity ,soil moisture and water level .There seems to be increased development towards wireless outcomes in comparison to wired systems. This systems provides a full network coverage in large facilities such as big farm, typical massive lengths of cabling that leads to remarkable return on investment. WSN can be used to identify moisture to admit the irrigation system and identify where and when to irrigate. It helps in maximizing crop yield and elevates profit.

B. Moisture sensor

In this proposed system, sensor node and sprinkler will be attached together. When a sensor detects low water level in the soil, sprinkler will supply more water. If the sensor detects excess water in the soil, sprinkler will supply water. More water is needed when the sensor is dry and this causes the soil to conduct easily (less resistance), while dry soil conducts electricity poorly (more resistance). Embedding the technology with the moisture sensor can save and reduce water consumption. Using the moisture sensor, water does not need to function or irrigate when the sensor has the right amount of water .

S1. Specification

1. Range-700ft
2. Moisture-0-100%
3. Temperature-40c to 85c
4. Height-4.3inch
5. Thickness-0.44inch
6. Weight-17g

C. IOT

The moisture sensor collects data from the soil, which will be processed before sending via wireless to the controller for further action. The sprinkler will supply water based on the condition of the soil. The data that are processed will be sent to the computer for monitoring by the farmers. The farmers can monitor their farm anywhere using internet connectivity by phone or computer. All the systems in the farm are connected to each other via wireless. The messy cabling like conventional method is not used anymore because it will be disturbing an irrigation process

D. Arduino

The Arduino uno is a microcontroller board based on the ATmega328. Arduino is an open source prototyping platform and it simply makes it ideal to use for all. It has a14 digital input\output pins, 6 analog pins, a 16MHz crystal oscillator, a USB connection, a power jack, an ICSP header and reset button.

Fig 5.1 Arduino

1. Specification

1. Microcontroller-ATmega328
2. Operating Voltage-5v
3. Input voltage-7 to 12v
4. Digital pins-14
5. Analog pins-6
6. Dc current for I/O pin-40mA
7. DC current for 3.3v pin-50mA
8. Flash memory-32KB
9. SRAM-2KB
10. EEPROM-1KB

E. ***DHT11***

The DHT11 sensors feature extremely accurate calibration of humidity chamber. A high performance 8 bit microcontroller is connected. It includes a resistive element and sense of wet NTC temperature measuring devices

F. ***Light dependent resistor***

A light dependent resistor is a component that is sensitive to light. When light falls upon it then the resistance changes. Values of the resistance of the LDR may change over many orders of magnitude the value of the resistance falling as the level of light increases.

VI. RESULT/OUTPUT

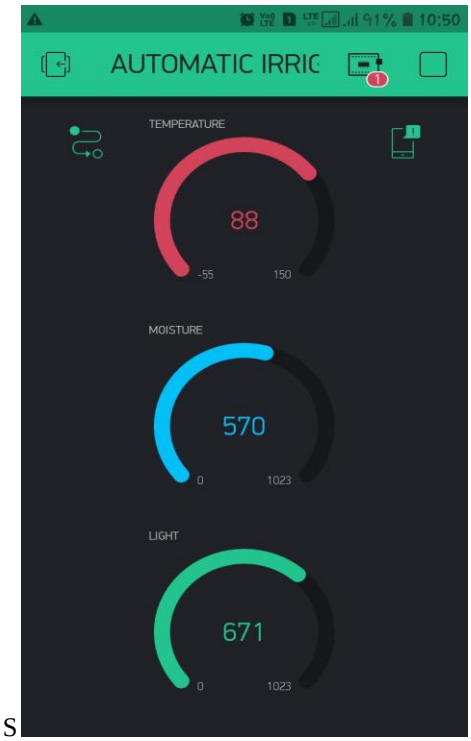

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Fig 6.1 Overall output in app

Fig 6.1 shows how the values would be shown in the app the data would be obtained for each cycle as set by the user

CONCLUSION

Agriculture water consumption is more than rainfall every year. Hence it required excess use of water for plants and consumed lot of time and power and required human intervention. This paper provides a fully automated irrigation system and provides a real time feedback control which monitors and controls all the activities of irrigation system efficiently. It reduces water, power consumption and cost. Further soil quality can be tested as a future enhancement.

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