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CROPS PRODUCTION SYSTEM USING ARDUINO WITH FLOAT LEVEL SENSOR

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Abstract -Smart Agriculture helps to reduce wastage, effective usage of fertilizer and thereby increase the crop yield. In this work, a system is developed to monitor crop-field using sensors (soil moisture sensor, PH sensor, Float level sensor) and automate the irrigation system.The data from sensors are sent to a Web server database using wireless transmission. This low productivity is because of two main reasons: Crop destroyed by wild animals and Crop destroyed by nature objects. This system will avoid natural destruction with help of roof top mechanism, which is controlled by IOT. The pump will be turned ON/OFF based on float level in the surrounding environment and status updated in the cloud automatically. The float sensor is used to detect the level of water inside the well and the pump is turned off, if it crosses the predefined threshold value and an automatic irrigation system is proposed with help of solenoid to reduce water wastage level. The proposed method is also easy to implement and environmentally friendly. It can save human life and property. Use of solar power to meet the power requirements of various sensors and also to power the water pump, connected circuitry, embedded circuits and associative devices also connected with conventional power sources during monsoons, night time or any solar power failure.

***Key Words*:**soil moisture sensor, float level sensor, PH sensor, microcontroller.

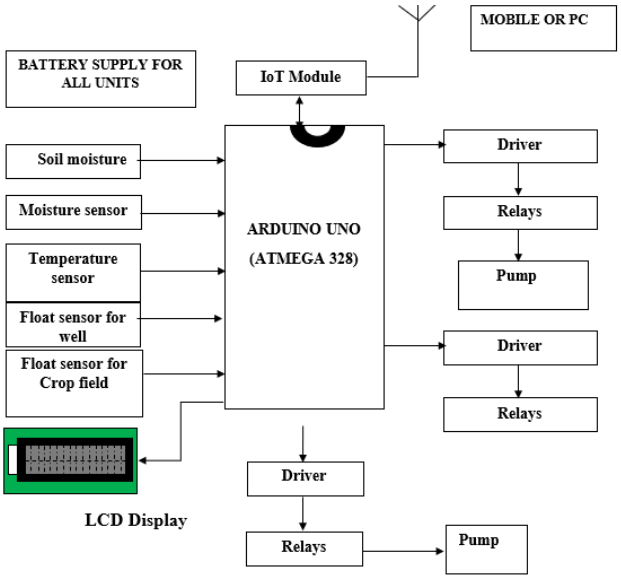
I.INTRODUCTION

In this current era the world has facing problem of water. All know water is basic need of Agriculture. The Irrigation known as Drip irrigation could be one of the solutions to this problem as it saves large amount of water. But this not the proper solution to this problem because we can't predict amount of water required for crops. An electronic device is responsible for sensing the temperature and Moisture conditions. Along with it a Bluetooth devise is added to the hardware device. The sensed environmental conditions are taken and sent to the Server, which has a MySQL database for storage of records. The sensor node is deployed in irrigation field for sensing soil moisture value and the sensed data is sent to controller node. On receiving sensor value the controller node checks it with required soil moisture value. When soil moisture in irrigation field is not up to the required level then the motor is switched on to irrigate associated agriculture field and alert message is send to registered mobile phone. Smart irrigation systems estimate and measure diminution of existing plant moisture in order to operate an irrigation system, restoring water as needed while minimizing excess water use. The effects of the applied amount of irrigation water, irrigation frequency and water use are particularly important. To improve water efficiency there must be a proper irrigation scheduling strategy.

II.WORKING OF THE SYSTEM

In solar powered one sensor node contains PH sensor, moisture and float level sensor, microcontroller (ATMEGA 328) and IoT. The communication with all distributed sensor node placed in the farm through IoT and itself act as a coordinated node in the wireless sensor network. The programming on the Arduino microcontroller is such way that after every minute sensor node sends soil parameter data to coordinator node via the IoT wireless communication protocol. The goal of coordinator node is to collect the parameters like humidity, moisture, temperature sensor and float senor. PC stores collected data in the database and analyzes the stored data. The system will work according to the algorithm developed for watering the crop. The board has an Ethernet interface and runs the simple data web server. Hence coordinator collects the data over IoT wireless communication protocol and allow user to monitor the data from a web browser. User can make the irrigation system ON or OFF remotely. The system will reduce the water consumption and giving uniform water

to the crop results in increasing yield. We can gather information from our mobile by using IoT through the sensors controlling the information from the Arduino board.



III.METHODOLOGY

In the field section, various sensors are deployed in the field like temperature sensor, moisture sensor, ultrasonic sensor and humidity sensor. The data collected from these sensors are connected to the Arduino UNO. In control section, the received data is verified with the threshold values. If moisture level is low then Arduino switches on a water pump to provide water to the plant. Water pump gets automatically off when system finds enough moisture in the soil and a message is sent to the user via IOT module, updating the status of water pump and soil moisture. These factors include attack of pests which can be controlled by spraying the crop with proper pesticides. An irrigation system for efficient water management and spray the pesticides for crops has been proposed. Parameters like moisture, temperature, humidity are measured by using sensors. The water and pesticides are sprayed by using spray motor and motor pump. The ultrasonic sensor is used to monitor the growth of the plants, one can observe the plants from anytime, anywhere in the webpage via IOT. In present, Thing speak is added which is a platform to control the Arduino that supports hardware platform. Monitoring the plant growth by using ultrasonic sensor and sending the status to the webpage via IOT module. Watering will be done automatically by predefined time delay.

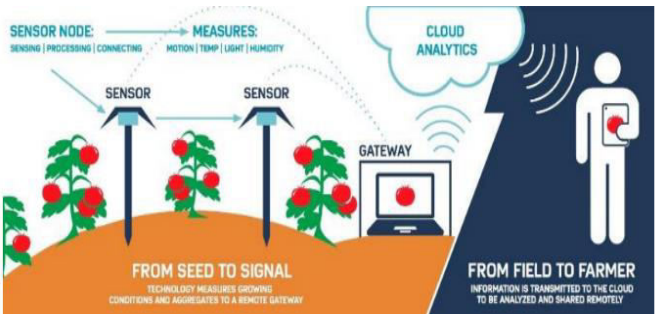


Fig-1: Architecture of Smart Irrigation.

IV.MODELING AND ANALYSIS

This is a modeling diagram crops production system using Arduino with float level sensor using various sensor are used to them.

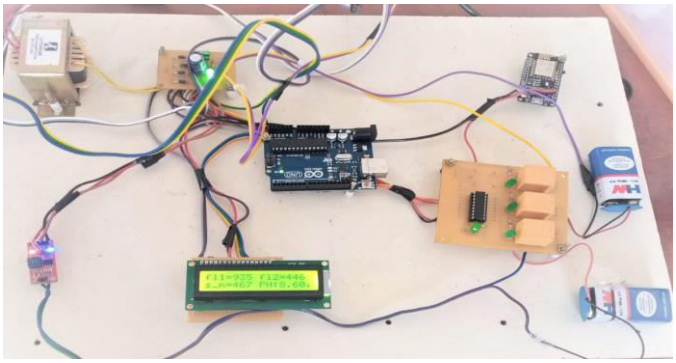
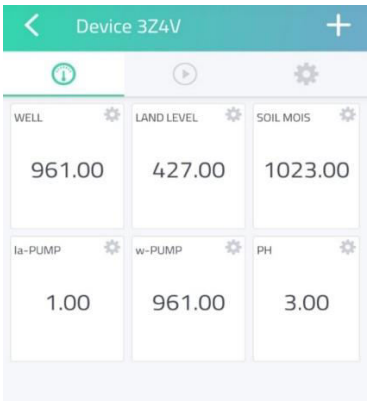
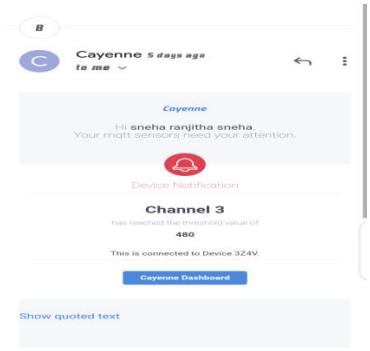


Fig -2: crops production system.

V.RESULTS AND DISCUSSION

In this technology, the humidity and temperature of plants are precisely controlled. Due to the variable atmospheric circumstances these conditions sometimes may vary from place to place in large farmhouse, which makes very difficult to maintain the uniformity at all the places in the farmhouse manually. It is observed that for the first time an android phone-control the Irrigation system, which could give the facilities of maintaining uniform environmental conditions are proposed. The Android Software Development Kit provides the tools and Application Programmable Interface necessary to begin developing applications on the Android platform using the Java programming language. Mobile phones have almost become an integral part of human life serving multiple needs of humans. This application makes use of the GPRS [General Packet Radio Service] feature of mobile phone as a solution for irrigation control system. GSM (Global System for Mobile Communication) is used to inform the user about the exact field condition. The information is passed onto the user request in the form of GMAIL.





VI.CONCLUSIONS

This review is proposed to support aggressive water management for the agricultural land. Microcontroller in the system promises an increase in the system's life by reducing the power consumption resulting in lower power consumption. It is considered to be used at Cricket stadiums or Golf stadiums and also in public garden areas for proper irrigation. Automated irrigation systems have a huge demand and future scope too. It is time saving, led to removal of human error in adjusting available soil moisture levels and to maximize their net profits in accordance to factors like sales, quality and growth of their product.

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