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Smart Irrigation System

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Abstract: ***In India, agriculture plays an important role for development in food production. In our country, agriculture depends on the monsoons which are not sufficient source of water.***
Internet of Things (IoT) is a milestone in the evolution of technology. IOT plays an important role in many fields, one of that is Agriculture by which it can feed billions of people on Earth in future. This paper aims to highlight the contribution of Smart Irrigation using Soil Moisturiser Sensory systems in relation to the Sustainable Development. The whole system is micro-control based can be operated in wireless transmission so there is no need to concern about irrigation timing as per crop or soil condition. Sensors are used to detect the soil moisture level or the water level in the field and with the help of microcontroller the sensor reading will be send to the farmer. The data regarding field is notified to the farmer on mobile. This system is useful in the areas where the is scarcity of water.
Keywords: Sensor, ESP8266(Node Mcu), Relay Module, Water Pump, Battery.

I. INTRODUCTION

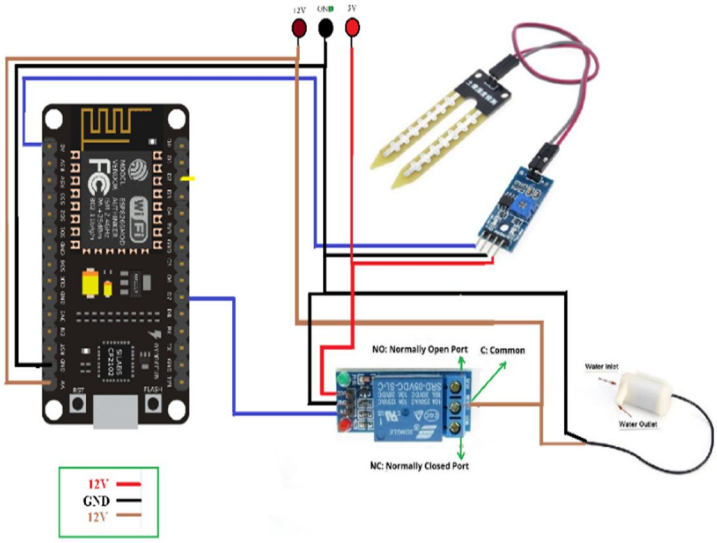
In India around 60-70% of economy depends on agriculture and to increase our production we need to upgrade the agricultural activities. Due to unplanned use of water, the ground water level is decreasing day by day, lack of rains and scarcity of land water also results in decrement in volume of water on earth. Nowadays, water shortage is becoming one of the biggest problem. We need water in each and every field. In our everyday life water is essential. Agriculture is one of fields where water is required in tremendous quantity. Wastage of water is the major problem in agriculture. Every time excess of water is give to the fields. There are many techniques to save or to control wastage of water in agriculture. The objective of the system is to conserve energy & water resources. Our system is handled manually and automatically that detects the level of water. Due to the climatic changes and lack of precision, agriculture have resulted in poor yield as compared to population growth. A smart irrigation system, contrary to a traditional irrigation method, regulates the supply of water. Mechanism of Smart Irrigation System is that it does not allows the wastage of water. Soil texture and Agriculture fields varies according to the area and the climatic changes that occurs in that particular area.

II. LITERATURE REVIEW

Sr.no	Year	Authors and journals	Name of topic	Features
1.	2016	Nikesh Gondchawar prof. R. S. kawitkar [IEEE].	IOT based smart Agriculture[1]	Smart irrigation with smart control and intelligent decision making based on accurate real time field data
2.	2015	Karan Kanara, vishal Zaveri [IEEE].	Sensors based automated irrigation system with IOT [2].	Objective of this paper is to provide on automatic irrigation system thereby saving time, and power of the farmers automatic environmental change detection.

III. METHODOLOGY

The shaft will be inserted in the soil at the end of the water course in the field. The circuit on the shaft will consist of water/moisture-detection sensor near the bottom, arduino uno and wifi module along with battery near the top of the stick, and an led light at the top.When water reaches the end of the field , the water/moisture-detection sensor will detect so . The using arduino will light up the led and using wifi module, will send a notification to the farmers cell-phone. When the notification received by the farmer then he will understood that the water will reached at the strick after he will reach at the farm and remove that stick from the water irrigated row and again insert into the another row which is not irrigated and he will also change the path of water.



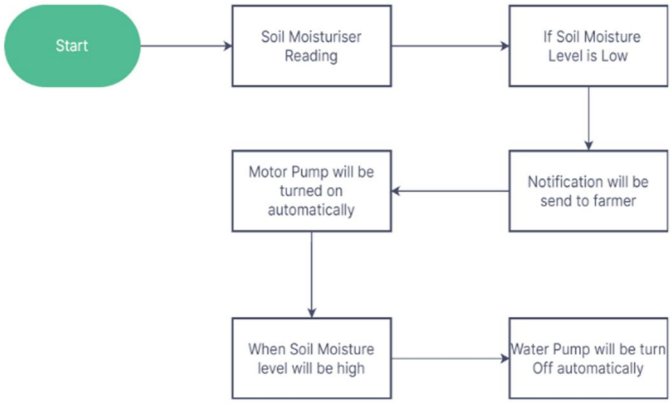
3.1 Circuit diagram

After completion of first row then the farmer turn off that row irrigation by turn off the servo motor and start the irrigation of next row.

After the all landscape was irrigated then the farmer will able to off the main supply from the DP.

In this way our smart irrigation system will be works.

Smart irrigation systems estimate and measure diminution of existing plant moisture in order to operate an irrigation system. The effects of the applied amount of irrigation water, irrigation frequency and water use are particularly important. Our project helps us to monitor the flow of water that is needed in each row that reduces the wastage of water and saves the time of farmer. Crops like sugarcane, soyabean, Corns, etc. are cultivated in large areas and are cultivated in rows. Around 30-50 rows are there and they are minimum 90cm apart from each other. These crops need time to time irrigation and takes lots of time. The soil moisturiser sensor will be placed at the end of the row and it will detect the soil moisture level, even the soil moisture level can seen through Blynk app by the farmer on his/her mobile. Once the Moisture level is detected by the sensor and if it's low the notification will be send on farmer's mobile (plants to be irrigated) through ESP8266.Then with the help relay module water pump will start automatically, the farmer can see on his/her mobile that the water pump is on or off. As the soil moisture level will reach to its max the water pump will turn off automatically. Then farmer can come and fix the sensor in another row. In this way our Smart Irrigation System will work.



3.2 -: Flowchart

IV. RESULT AND DISCUSSION

1) Smart Irrigation system is IOT based project, that helps to irrigate our crops, lawns and plants.
2) Our project uses several technologies like ESP8266, Soil Moisturiser Sensor to detect the soil moisture level and Blynk IOT app to get notification and to see the soil moisture level.
3) This whole system will be controlled from the users cell phone.
4) In case there is emergency no one is there to take care of the crops/plants, in this situation when water is needed the notification will be send on the mobile.
5) After irrigation the water pump will turn off automatically and user can even see the soil moisture level on his/her cell phone.

V. FUTURE SCOPE

1) We are using soil moisture detector sensor for the sensing the water.
2) We are using PVC pipe as a stick which is inserted in the farm at the end of the row and the whole model of the project is operate with the help of the that stick.
3) By using this system the farmers saves his all efforts which is he giving in the farm, he can save his valuable time and spend that time to do other work in the farm.
4) This project which is mostly helps for saving of the water usual in the farmers farm well water.
5) By using this “SMART IRRIGATION SYSTEM” whole landscape will irrigated properly without wasting water in the farm and also farmers time.

VI. CONCLUSION

1) This technology also allows for remote monitoring and control of irrigation systems. providing farmers and gardeners with greater control over reducing labour costs.
2) Overall, the implementation of smart irrigation systems using water sensors can help promote sustainable water use.
3) It will increase crop yields and will reduce environmental impact.
4) This system is helpful in places where there is little rain or in the dearth region also.
5) By using this system the farmers and able to use efficient usage of water and it is easy to operate everyone like women and elders.

VII. ACKNOWLEDGEMENT

It was a great learning experience for each one of us It was a great privilege to work on this project. We would like to give a special thanks to our project guide, who helped us to solve the technical issues in our project. This work has been done by all the four B.Tech students of first year in 2nd semester ESE under the supervision and guidance of Prof. Manisha More, Head Dr. C.M Mahajan of DESh department. Work is in progress to further add few more sensors for various applications.

VIII. ADVANTAGES

We are using soil moisture detector sensor for the sensing the water.

1) We are using PVC pipe as a stick which is inserted in the farm at the end of the row and the whole model of the project is operate with the help of the stick.
2) We are also thinking new innovation in our project that is we use servo motor for the irrigate the farm which is automatically operated by the farmers using the mobile phone.
3) For the complete irrigation of the farm and managing the water flow we are use the servo motors which is already implemented in the PVC pipes for the each row in the farm and the farmer is able to stop the irrigation of that row which is completely irrigated by using the mobile phone sitting at the his home.
4) By using this system the farmers saves his all efforts which is he giving in the farm, he can save his valuable time and spend that time in the other work in the farm.
5) This project which is mostly helps for saving of the water usual in the farmers farm well water.
6) By using this “SMART IRRIGATION SYSTEM” whole landscape of farmer will irrigated properly without wasting the water in the farm and also farmers time.

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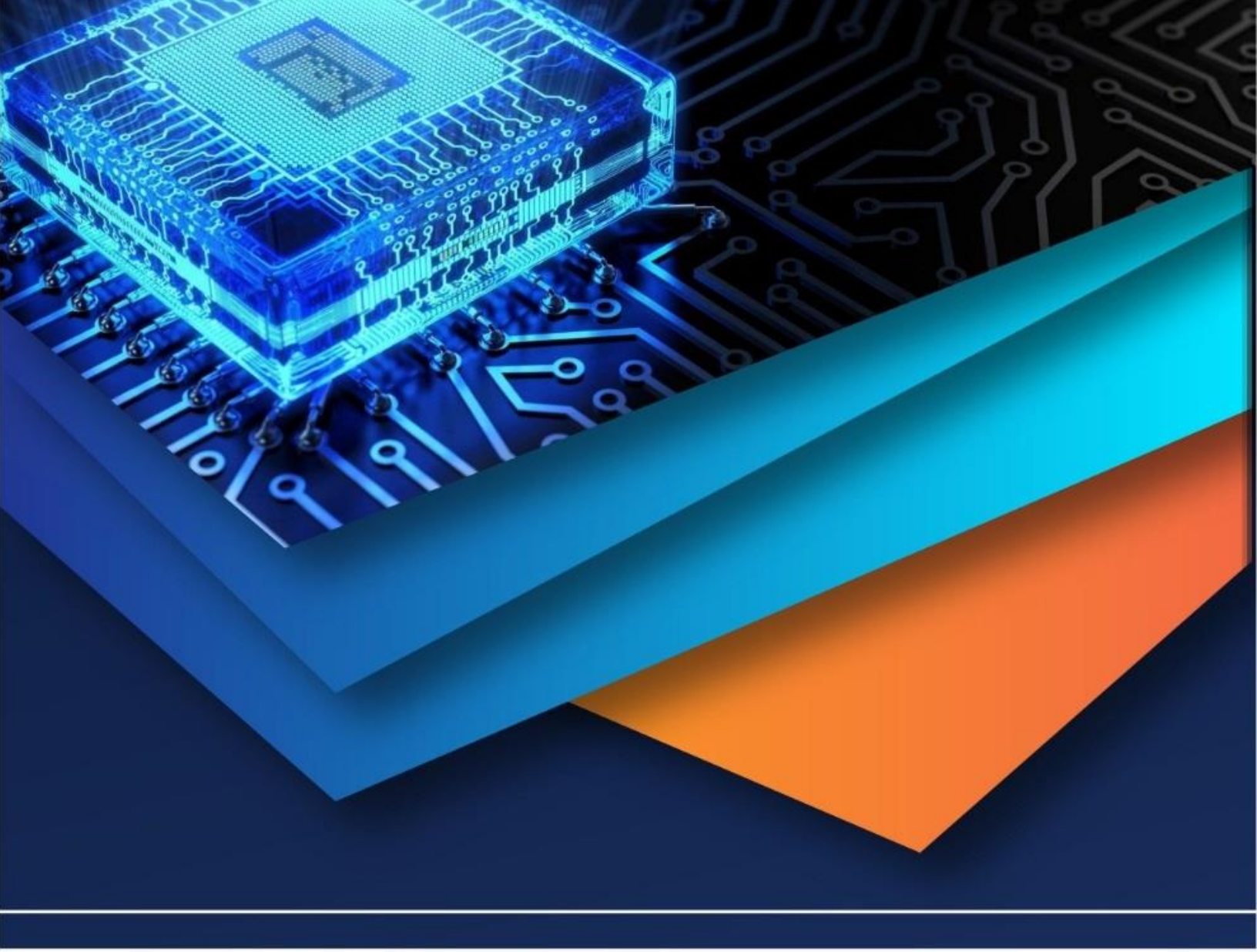

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