



Arduino based Automated Irrigation system Monitoring.

Group-8

Section-L

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Abstract—Nowadays, Science and Innovation make our life faster and easier. Bangladesh is an agricultural Country but from the very beginning our farmers are using the traditional method in their farming. But it's high time to introduce technology in this sector. From this point of view, we are going to provide a smart solution. The goal of the project is to design an automatic irrigation system monitoring for the farmers. In This Plant Watering System, Soil Moisture Sensor checks the moisture level in the soil and 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. This system will be very sustainable and useful in Farms, gardens, home etc. This system will be completely automated and there is no need for any human intervention. After investigate we found that actually farmers are facing problem to keep the moisture level of the soil good for a long time, how and when the water is need for their crops, they don't know this thing well. This system will be the Proper solution of their problem. The system will fully automated, cost friendly and easy to use. The system will be going to help farmers to produce more crops, reduce their hamper and above all they can take the necessary steps by getting message alert. The overall system will be going to simulated by using proteus 8 professional simulation software.

Keywords—Smart Irrigation, Arduino, Soil Moisture Sensor, Water Pump.

I. INTRODUCTION

Irrigation is the process by which we supply water to land or crops to help better growth of different types of crops. In our country our farmers are actually using the traditional method for watering the crops and monitoring the growth. We are come here with a smart solution for our farmers-called smart irrigation. To build this project here Smart irrigation technology uses weather data or soil moisture data to determine the irrigation need of the landscape. The system can measure the water level of tanks and also able to on/off the motor whenever the land or plant needs water. These smart irrigation systems maximize irrigation efficiency by reducing water waste, while maintaining plant health and quality. As an Engineer our responsibility is to provide better solution for our society. From this point of view we are going to develop a Smart irrigation system solution by using Ultrasonic sensor, Soil Moisture Sensor, Arduino Uno, 2N2222 BIPOLAR Silicon NPN Low Power High Frequency Bipolar Transistor (500mW, 200°C), Relay Active animate relay model, Capacitor, Inductor and other necessary components.

From our research we find that our farmers are facing problem by using the traditional method. So we believe our farmers must be benefited through the system we are going to build. The system will be cost friendly, sustainable, easier to use and the component we use that are really available in the market as well. Our uneducated local farmers will be very much benefited from this system.

This paper is structured as follows. In Section II we discussed the earlier researches that has been done to smart irrigation system monitoring. The basic working process of our proposed model are stated in Section III, objective followed to complete the model is defined in Section IV and the software simulations and coding part are described in Section V Result and Discussion described in Section VI Society and environmental and Future work are described in this portion. VII conclusion and future work is described in the last part of the paper

II. LITERATURE REVIEW

Najaf – IRAQ (4th SICN-2019-4th Scientific International Conference) invent or provide a solution for smart irrigation system using Arduino and GSM based message notification with monitoring system for farmers. He give a better solution but there are some limitation as well of this project-first of all this project is not reasonable at all and secondly need apps and android phone but as we are thinking this project for our poor or local farmers so using android apps or high configuration mobile can cause problem for our local farmers. But for city area or city farmers might be create a great impact [1]. Mrs Roopa Mahadev, Kushmithaa N, Meghana H, Mukrram Pasha and Niveditha S invent a smart irrigation solution on May 2018 ISSN (online): 2349-6010. This project is also good but some limitation like solar power energy, or more function they can easily add in their work. Here they are using the message alert system which is very innovative and impactful for our rural and city farmers as well. But here we are going to provide

an easy and cost friendly solution for our rural farmers. [2]

III. BASIC IDEA OF PROJECT

In this project simulation Moisture Sensor are used to measure the soil moisture content. The display used here will show the motor on/off and some message, when the motor will on/off mean pump status, moisture contents. One water pump is used to supply water from the source to tank. On the Other hand, Watering pump is supplying the water from the tank to plant. Actually this pump is used to water the plant.

How many moisture content are present in the land that actually measured by the soil moisture sensor. Actually, they will be going to know the current status of the pump, how the level of the water and is it pumping or not, of or on, how the whole procedure is running time to time. The overall Process will be running through a code.

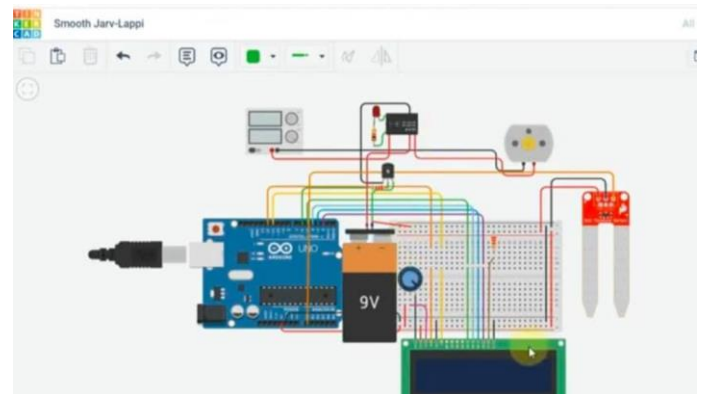


Figure 2: Using Tinker cad Circuit Diagram.

V. RESULTS AND DISCUSSION

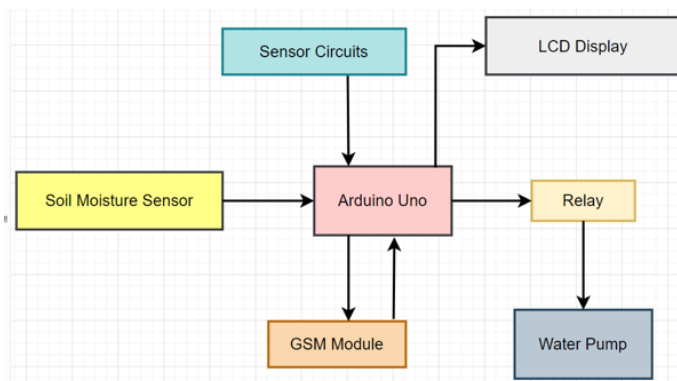


Figure 1: Block diagram of Arduino based Automated Irrigation system.

IV. SOFTWARE IMPLEMENTATION FOR SMART IRRIGATION SYSTEM

In the simulation part we use tinkercad software and Arduino for code generation and running. First of all we take all the component as necessary and then implement the circuit as follow in the figure. After implementing the circuit, we write down the code in the Arduino and compiled it. After compiled successfully then we put it on the proteus. In the mean time we locate the Hex file in our c drive and copy the link and put the file link in the Arduino board. Secondly in the similar process from the library we add soil moisture sensor hex file and run the simulation successfully. Thus, our condition and logic behind of the project is working successfully.

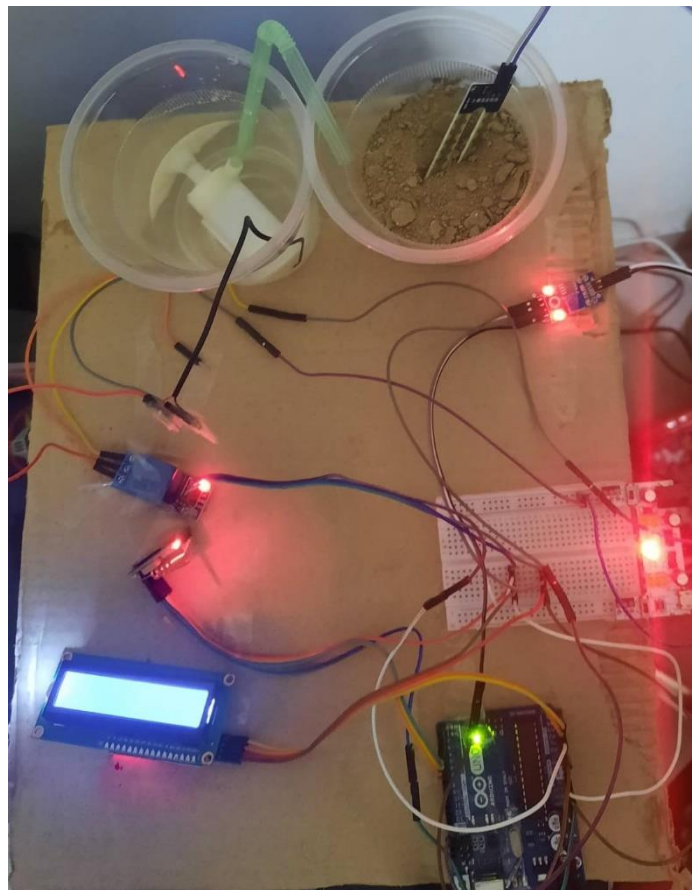


Figure 3: When water pump is off in Irrigation system

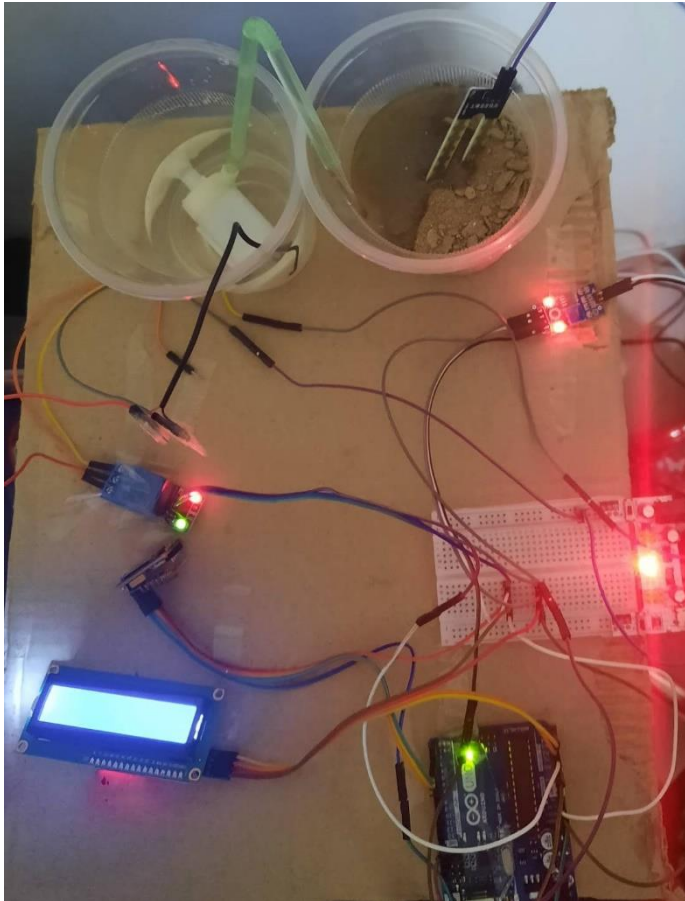


Figure 4: When water pump is on in Irrigation system

Here in the figure 3-4, we can see that the simulation logic and condition matched properly. It will be going to be a great solution with a cheap cost for our farmers. There is no error in the simulation but also have some limitation of time, fund regarding software or research opportunities. So, we can easily say that the objective or goal of the simulation work is proved.

VI. FUTURE WORK / SOCIETY AND ENVIRONMENTAL IMPACT

An automatic irrigation system helps to meet more accurately all the watering needs of our plants. It conserves water, saves time and money while achieving the greenest, healthiest, and most beautiful yard. Besides, improvements in the irrigation field include rain and moisture sensors. Farmers can produce more crops by taking right decision from this system within a short time. As a developing country it already has a great social value and positive sites. This project system is socially very impactful and our farmers are mainly benefited by this.

This system is not traditional system that we are using now. But the most important notable things is that by this system there is no hamper on our culture, political issues or religious prospective. The system is environment friendly, saves time, water, produce more crops, cost effective, accurate and automated.

Future Improvement-

-Adding of GSM module can create a great impact in near future. Adding the newest controlling and easier approach can make the difference in the innovation sector of this project.

- Platform independent application.
- Solar energy can be used to generate the power.
- Various other functionality can also be added depending upon the scope of the objective.

VII. CONCLUSION/LIMITATIONS

In conclusion we can say that the project has a high social impact. As it is already dealt, the system is none existing, and still majority of the farmers use the traditional human intervention-based irrigation, due to which there is huge loss in cultivation. Benefits and can be operated with less manpower, Over-watering and under-watering affects the crop so proper amount of water should be supplied. By analyzing the soil parameters system waters, the farm. So, by this wastage of water reduced. It reduces the human resources. This irrigation system was found to be feasible and cost effective for optimizing water resources for agricultural production. The irrigation system can be adjusted to a variety of specific crop needs and requires minimum maintenance. Every work has a limitation in the world. So, our work is not special from this point of view. First of all, we want to add GSM module but for some short hand we could not use this properly so we remove this option. If our Arduino module is damaged then the system will not be going to run properly. The whole system will turn off so that's the main limitation we find till now. Otherwise, all the process, code and simulation step were done perfectly as per our goal to provide a smart solution for poor rural farmers.

VIII. REFERENCES

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