Quest Journals
Journal of Electronics and Communication Engineering Research
Volume 8 ~ Issue 4 (2022) pp: 10-13
ISSN(Online) : 2321-5941
www.questjournals.org

Research Paper

Soil Moisture Detection and Monitoring Through Iot

C VIJAYA BHASKAR, A.LAKSHMIPRIYA, K.HEMAPRIYA, A.HEMANTHKUMAR, V T KIREETI
Department of Electronics & Communication Engineering
Siddharth Institute of Engineering & Technology (Autonomous),
Puttur, Andhra Pradesh, India -517583.

ABSTRACT:
Soil moisture probe is used to detect the amount of moisture in soil (roots of a plant). We can give a chance to our plants a voice with a wireless soil moisturesensor. Plants die all the time from lack of watering, we were busy and those aren't going to tell us, So this prototype soil moisture probe is a way to eradicate the death of plants due to lack of water. In this IOT technology is used which reads the data from the plant and sends a message to theuser/farmer. Also implemented automatic on/off of a motor which works onmoisture conditions. This helps to monitor the plant even in the absence of human.
KEYWORDS: *IoT, Sensors,GPS, Microcontroller,Wi-Fi*

***R**eceived 14 Apr, 2022; **R**evised 28 Apr, 2022; **A**ccepted 30 Apr, 2022 © The author(s) 2022.*
P**ublished with open access at **www.questjournals.org

I. INTRODUCTION

Now a days sensor technology is one of the fastest growingtechnologies. A sensor is a device capable of detecting a change in the physical or chemical environment which then converts it into electrical signals both electric current and voltage [1]. Sensor technology is also related to wireless technology, this technology is known as wireless sensor network (WSN). Wireless sensors are standard measurement devices that measure one or more physical quantities and use transmitters equipped with the conversion of measured physical quantities into radio signals and transmit radio signalsthrough a communication model. The radio signal is interpreted by the receiver or electronic instrument which then converts the wireless radio signalinto the desired output [2]. The role of wireless sensor technology can be applied in human life to help people obtain information quickly and more accurately. One application that can be done by this technology is in the application of soil moisture sensors. This sensor will provide information about the moisture content in the soil. Wireless sensor network (WSN) is one of the emerging technologies which finds application in variety of fields such as environmental and health monitoring, battle field surveillance, and industry process control [1]. Sensor networks consist of a large number of sensor nodes, which are normally deployed in an ad-hoc manner and they coordinate among themselves to perform a sensing task. The design of a WSN focuses mainly on extending the lifetime of the system since nodes work on battery while energy constraints are secondary criteria to the traditional wireless networks like cellular networks.

II. LITERATURE SURVEY

Sandip Khot, Dr. M. S. Gaikwad proposed Green House Parameters Monitoring System. They have used raspberry pi, Wi-Fi, web server in their system .Light intensity based most of the devices can be controlled. Most of the time to differentiate between day and night time, measuring light form sunlight is essential. Where, light measurement and analysis is an important step in ensuring efficiency and safety. Plant growth in farming is purely dependent on the light intensity falling on the top of canopy. This paper introduces real time remote Light intensity monitoring system using Raspberry Pi which enables the user to track the lighting system in green house remotely for improving plant growth .By gathering all data it uploads to cloud based server from which the data is accessible to user via wireless internet connection to cloud from smart phone or tablet. Kiran Ganesan, Uzma Walele suggested Raspberry-Pi Based Automated Greenhouse A greenhouse provides an environment to grow plants all year round, even on cold and cloudy days. However, extreme environmental factors inside the greenhouse such as high temperatures and a high humidity can negatively impact the plants. Consequently, controlling this environment is essential in order for the plants to grow strong and healthy. The aim of this

project is to design and build a greenhouse controller that can maintain the environment, by acting upon live sensor readings and be able to display the status of the system to the owner.

III. PROPOSDED METHODOLOGY:

The proposed model proficiently screens climatic parameters and intelligently regulates the climate parametric values (using sensors, attached output devices, Arduino, Soil mature sensor) to capitalize crop yield and enhance the production. The real-time instantaneous status of soil canbe seen on LCD. This study consists of several steps that begin with data collection which was done automatically through the sensor. For more details about the input and output processes of the application system will be illustrated through the general architecture that can be seen in Figure.

The Sensing Module

The sensing unit as shown in fig. 1 is responsible for harvesting the moisture content of the soil at a particular time. The system consists of three sensor unit boxes for three crop species and each sensor box consists of a network of five Soil Moisture Sensors, an Arduino UNO Microcontroller (Slave Arduino) and a Nrf24L01+ transceiver. The soil moisture is measured using the Probe- type Soil Moisture Sensor. The sensor gives out a value usually between the range of 420 and 1023 based on its architecture and moisture content. The Sensing Units establishes a wireless serial communication with the Master Arduino (actuating unit) via the Nrf24L01+ communication transceivers. Power is supplied to this unit by a 9 Volts D.C. battery.

Soil-Moisture Sensors

This device is used to approximately determine the moisture content of the soil based on the dielectric constant (soil bulk permittivity) of the soil. Precise water content measurements of the soil are essential for grasping the concepts of chemical as well as organic course in the roots of plants as well as in the vadose zone.

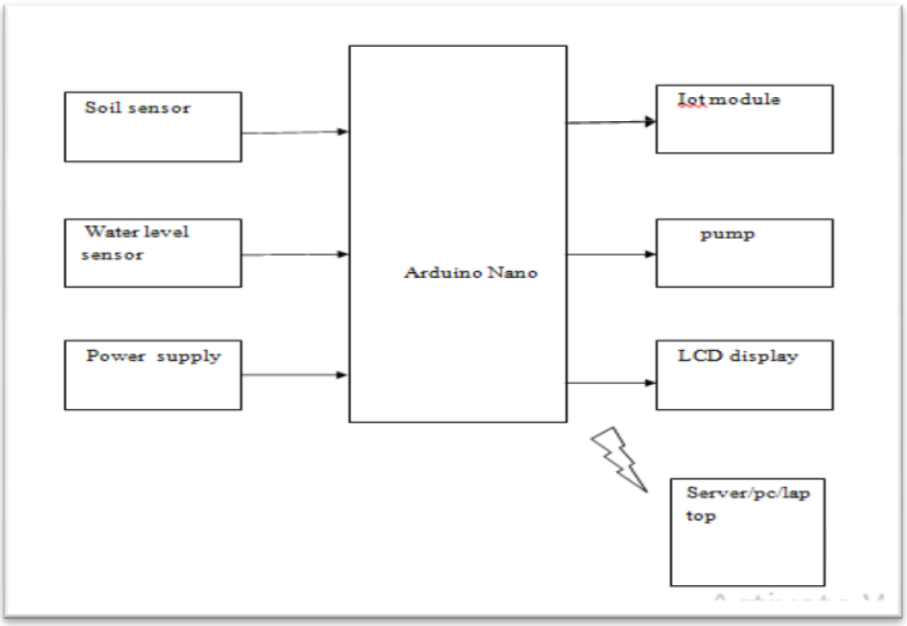
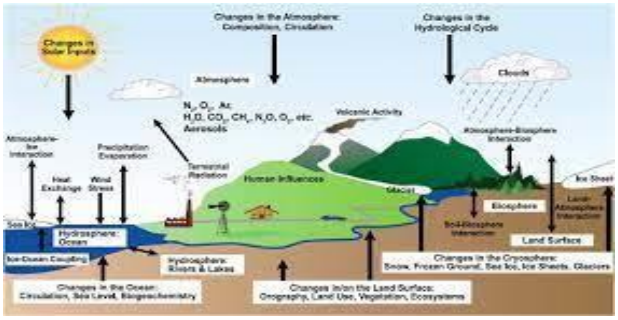


Fig 3.1: Block diagram

IV. Applications

Some of the applications are:

- Numerous research applications
- Agricultural science
- Climate researches
- Used in Environmental science



V. RESULTS AND DISCUSSION

- We sense the data of soil and display it on the system in whichArduino libraries installed.
- It will give the result of soil moisture level and based on that itwill provide water to the plants

Fig 5.1: Output image

VI. CONCLUSION

The proposed model explores the use of IoT (Internet of things) in the agriculture sector. This model aims at increasing the crop yield by helping in predicting better crop sequence for a particular soil. Thing speak helps in real time sampling of the soil and hence the data acquired can be further used for analyzing the crop. We have also taken many readings of the soil moisture, temperature and humidity of the environment for various days at different times of the day. Data on the cloud also helps the agriculturists in improving the yield, evaluating the manures, illness in the fields. This system is cost effective and feasible. It also focuses on

optimizing the use of water resources which combats issues like water scarcity and ensures sustainability. This model focuses on the utilization of IoT in agriculture and the solutions proposed in this paper will improve farming methods, increase productivity and lead to effective use of limited resources.

REFERENCES

[1]. G., Kumar, Research paper on water irrigation by using wireless sensor network. International Journal of Scientific Research Engineering and Technology (IJSRET). (2014) 3–4.
[2]. M. F., Leroux, and G. V., Raghavan, Design of an automated irrigation system. McGill University Canada, research paper. (2005).
[3]. A., Tyagi, N., Gupta, J. P., Navani, M. R., Tiwari, and M. A., Gupta, Smartirrigation system.International Journal for Innovative Research in Science andTechnology. 3(10) (2017).
[4]. M., Umeh, M., Njideka, S. O., Okafor, and F. C., Agba, Intelligent microcontroller-based irrigation system with sensors. American Journal of Computer Science and Engineering. 2(1) (2015) 1–4.
[5]. M., van Iersel, R. M., Seymour, M., Chappell, F., Watson, and S., Dove, SoilMoisture Sensor- Based Irrigation Reduces Water Use and Nutrient Leaching in a Commercial Nursery. 54(5) (2001) 28–34.
[6]. S. R. N., Reddy, Design of remote monitoring and control system with automatic irrigation system using GSM-bluetooth. International Journal of Computer Applications. 47(12) (2012).
[7]. I., Gautam, and S. R. N., Reddy, Innovative GSM bluetooth based remotecontrolled embedded system for irrigation. International Journal of Computer Applications. 47(13) (2012).
[8]. M., Asadullah, and K., Ullah, Smart home automation system using Bluetooth technology. In 2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT), IEEE. (2017) 1-6.