

Smart Agriculture and Water Quality Monitoring using IOT

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Abstract - Nowadays Internet of Things (IoT) and Remote Sensing (RS) techniques are used in different area of research for monitoring, collecting and analysis data from remote locations. In our system on the basis of water quality motor can automatically ON/OFF. Since the water quality monitoring system is a critical implementation for the issue of pollution of water, with increase in the development of technology and advancement in the Internet of Things (IOT) environment, the real time water quality monitoring system is remotely monitored by the means of storing the data, transmission and processing. This paper presents a smart water quality monitoring with sensor interface device in internet of things. The smart water quality system consists of design board, sensors, Wi-Fi module and personal computer. It is programmed in high speed integrated circuit hardware description language and embedded c programming language. The proposed system collects the five parameters of water such as water pH, water level, turbidity, conductivity and temperature of water with high speed from various sensors using thing speak.

Keywords: smart water parameters; Sensors; Wi-Fi; and Thing Speak.

I. INTRODUCTION

This system help to detecting Water Quality and use for agriculture purpose such as per reading of Turbidity, pH Level, Electrical Conductivity, Temperature, Acidity, Alkalinity, total dissolved solids. We suggest suitable farming to farmer and also which disease occur due to impure water and also nd water bacteria using image processing. Water Disease Detection for Human Health. Water is used in various activities, like consumption, agriculture and travel, which may affect water quality. Therefore, the water quality monitoring is necessary which includes several chemical parameters some of these are pH, redox potential, conductivity, and dissolved oxygen, ammonium and chloride ion amount. The water quality problems of surface water bodies are predominately caused by organic and nutrient material loads. More than 90percentage of the River Basin Management Plans (RBMP) assessed indicated that agriculture is a significant pressure in the basin, including diffuse or point source pollution by organic matter, nutrients, pesticides and hydro-morphological impacts. The Plan gives the diffuse Nitrogen and Phosphorous load of each surface water body identifying the load from agricultural waste water body identifying the load from agricultural, waste water treatment plan, urban and other areas to the water body. [5]

There is need to improve existing system for monitoring water bodies, given that laboratory methods are too slow to develop an operational response and does not provide a level of public health protection in real time. Improve and expand monitoring and assessment tools to ensure a statistically robust and comprehensive picture of the status of the aquatic environment for the purpose of further planning. Water is an essential need for human survival and therefore there must be mechanisms put in place to vigorously test the quality of water that made available for drinking in town and city articulated supplies and as well as the rivers, creeks and shoreline propose and experimentally evaluate an automated system called, "Smart Irrigation System" is to make it more innovative, user friendly, time saving and more efficient than the existing system. Measuring four parameters such as soil moisture, temperature, humidity and pH values and the system also includes water quality measurement. we also help to farmer to increase life of plant in this system suggest best plant for farming so farmer can increase productivity of plants. In our system detect water bacteria so farmer can save plant and fruits.our system can also help to irrigation department by moter on off and check water quality.

II. LITRATURE SURVEY

[1] Priya J , Sailusha Chekuri ; The vast network of devices connected to the Internet, including smart phones and

tablets and almost anything with a sensor on it cars, machines in production plants, jet engines, oil drills, wearable devices, and more. These things collect and exchange data. Limitation Working: The key parameters monitored in the proposed system are conductivity, turbidity, water level and pH. The block diagram of the proposed system is shown in a controller forms the central part of the IoT enabled water quality monitoring system. As seen from Table 4, it is observed that most of the IoT based solutions use a controller with external Wi-Fi. Such designs are not cost elective, power ecient and also result in complex circuitry. In this work, TI CC3200 is a single chip micro controller with in-built Wi-Fi module and ARM Cortex M4 core, which can be connected to the nearest Wi-Fi hot spot for internet connectivity. Sensors are directly interfaced to the controller since the proposed system is to monitor domestic water quality. The sensor parameters such as conductivity, turbidity, water level and pH are [2] the Quality of the water is very important case study in the proposed project. The physical and chemical impurities and test methods of water and limits of impurities as per Indian standards are studied. Natural water or fresh water rarely contains more than 2000 ppm of dissolved solids.

[2] Stefano Basagni, M. Yousof Naderi, Chiara Petrioli, and Dora Spenza, are the result of endowing WSN nodes with the capability of extracting energy from the surrounding environment. Energy harvesting can exploit different sources of energy, such as solar power, wind, mechanical vibrations, temperature variations, magnetic ends, etc. [4] Working: A sensor node is developed for detecting salinity in ground waters as well as the water temperature in surface waters. In, the authors have developed a WSN and an energy harvesting system (based on a solar panel) to detect nitrate, ammonium and chloride levels in rivers and lakes. Energy harvesting techniques along with hibernation methods play an important role in extending the lifetime of sensor nodes. Initiatives have been taken all over the globe to develop projects based on sampling water to aid in controlling marine environments. It may not be specific to water pollution monitoring but similar concepts are involved.

Libellous Smart Water device monitors the status of an aquarium's health in Europe.

[3] S. M. Khaled Reza, Shah Ahsanuzzaman Md. Tariq, S.M. Mohsin Reza; we introduce the notion of water level monitoring and management within the context of electrical conductivity of the water. More specifically, we investigate the microcontroller based water level sensing and controlling in a wired and wireless environment. Water Level management approach would help in reducing the home power consumption and as well as water overflow. Furthermore, it can indicate the amount of water in the tank that can support Global Water types including cellular dataloggers, satellite data transmission systems for remote

water monitoring system. Moreover, cellular phones with relative high computation power and high quality graphical user interface became available recently.

[4].A PLC is a digital computer used to automate electromechanical processes. This research is based on automation of a water tank by using Siemens PLC. Automatic control of water tanks can work continuously and can provide accurate quantity of water in less time. In such process there is no need of labor so there is no human error. Without human error, the quality of product is better and the cost of production would definitely decrease with no error in quantity required. Water level sensing can be implemented in industrial plants, commercial use and even at home.

[5].Everyone here we are going to learn about saving the water efficiently. So go through the steps and the Sentences carefully. Water tank overflow is a common problem which leads to the wastage of water. Though there are many solutions to it like ball valves which automatically stop the water flow once the tank gets full. The water level controller circuit is a simple mechanism to detect and control the level of water in the overhead tank and also in the other containers. Nowadays, all the householders/owners are storing the water in overhead tanks by using the pumps. When the water is stored in the tank, no one can identify the level of water and also, no one can know when the water tank will fill. Hence there is an overflow of water in the tank, thus there is a wastage of energy and water.

III. PROPOSED SYSTEM

Our System will help to detecting Water Quality and use for agriculture purpose such as per reading of Turbidity, pH Level, Electrical Conductivity, Temperature, Acidity, Alkalinity, Total dissolved Solids we suggest suitable farming to farmer and also which disease occur due to impure water and also water bacteria using image processing. Water Disease Detection for Human Health and we also help to farmer to increase life of plant in this system suggest best plant for farming so farmer can increase productivity of plants. In our system detect water bacteria so farmer can save plant and fruits. Our system can also help to irrigation department by motor on off and check water quality.

In this system we can overcome many drawbacks of existing system like water wastage, Save Human life plant life.

In existing system there is no any mechanism for detecting water monitoring and suggest plant using water also suggest disease using water quality.

IV. MODULE

1: Motor ON/OFF on the base of Moisture Sensor.

2. Motor ON/OFF.
3. Check Water Quality for Drinking on Mobile Application.
4. Suggest Plant Production on basis of water Quality on Mobile Application.
5. All Data store on Cloud.
6. Check Water Disease on basis Of Water Quality.
7. In This system we can detect plant disease.

V. ARCHITECTURE

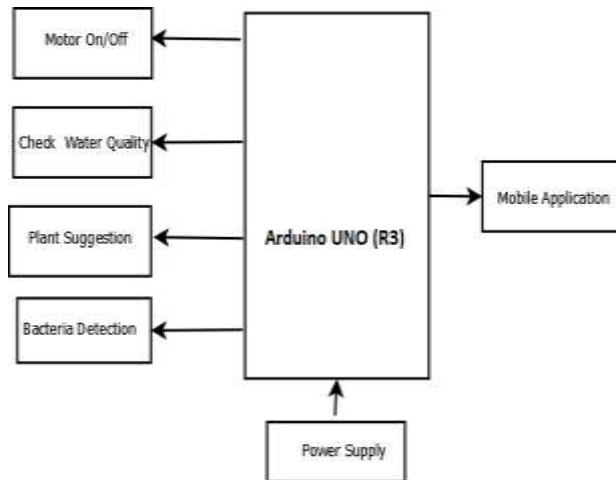


Fig 1.Architecture

In this architecture the PH sensor and Soil moisture sensor are connected to the Arduino. It checks the soil moisture; if moisture is at particular threshold then it decides to on/off the water pump and it will send the notification to the user cell phone. Turbidity sensor is also connected to Arduino, It checks the water quality & sends the notifications to the user. The plant disease identification and crop suggestions are done through system. The data is stored on cloud, through which system identify the disease and suggest the crop plantation to the user.

VI. SENSORS DETAILS

1. Arduino Kit(Uno)

The Starter Kit walks you through the basics of using the Arduino in a hands-on way. You'll learn through building

Several creative projects. The kit includes a selection of the most common and useful electronic components.

2. pH sensor

A pH meter is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH.

3. Turbidity sensor

Turbidity sensors measure the amount of light that is scattered by the suspended solids in water. As the amount

of total suspended solids (TSS) in water increases, the water's turbidity level (and cloudiness or haziness) increases.

4. Electric conductivity

Electrical conductivity is the measure of the amount of electrical current a material can carry or its ability to carry a current. Electrical conductivity is also known as specific conductance.

5. Cables

Electrical cables are used to connect two or more devices, enabling the transfer of electrical signals or power from one device to the other. Cables are used for a wide range of purposes, and each must be tailored for that purpose. Cables are used extensively in electronic devices for power and signal circuits.

6. Buzzer

A buzzer or beeper is an audio signalling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

7. GSM

The Global System for Mobile Communications is a standard developed by the European Telecommunications Standards Institute to describe the protocols for second-generation digital cellular networks used by mobile devices such as mobile phones and tablets.

8. Relay

A relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.

9. Multiplexer

In electronics, a multiplexer, also known as a data selector, is a device that selects between several analog or digital input signals and forwards it to a single output line. A multiplexer of inputs has select lines, which are used to select which input line to send to the output.

VII. ADVANTAGES

1. Save plant Life
2. Save Human Life.
3. Decrease Water Wastage.

VIII. CONCLUSION

The main aim of this project work is develop a real time water quality monitoring and smart irrigation system is to

make it more innovative, user friendly, and time saving and more efficient than existing system, it can be measuring four parameters such as soil, moisture, temperature, humidity and pH value. In system we help to irrigation department by checking water quality every minute so we can save people life .We also help to farmer to check water bacteria. In our mobile application we provide plant production information. Save water wastage, save plant life and give suitable water to peoples and suggest plant disease using water.

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