

IOT BASED WATER POLLUTION MONITORING SYSTEM FOR REAL TIME APPLICATIONS USING CLOUD

Roshani Gawande¹, Sarika Mare², Shrutika Kamble³, Mitali Kenjale⁴

¹ Assistant Professor, Department of Electronics and Telecommunication Engineering, PVPIT, Pune, Maharashtra, India

² Student, Department of Electronics and Telecommunication Engineering, PVPIT, Pune, Maharashtra, India

³ Student, Department of Electronics and Telecommunication Engineering, PVPIT, Pune, Maharashtra, India

⁴ Student, Department of Electronics and Telecommunication Engineering, PVPIT, Pune, Maharashtra, India

ABSTRACT

Water pollution is one of the biggest threats for the green globalization. Water pollution affects human health by causing waterborne diseases. To prevent the water pollution, necessary steps are to be taken. First step is to estimate the water parameters like pH, turbidity, conductivity etc., as the variations in the values of these parameters point towards the presence of pollutants. In the present scenario, water parameters are detected by chemical tester laboratory test, where the testing equipment's are stationary and samples are provided to testing equipment's. Thus, it is a manual system with tedious process and is very time consuming. In order to minimize the time and to make the system automated, the testing equipment's can be placed in the river water and detection of pollution can be made remotely. To ensure the safe supply of drinking water, the quality should be monitored in real time for that purpose Arduino based water quality monitoring has been proposed. In this report, the design of Arduino based water quality monitoring system that monitors the quality of water in real time is presented. This system consists of different sensors which measures the water quality parameter such as pH, conductivity, muddiness of water, temperature.

Keyword : - Wireless sensor network, Water quality monitoring, Soil monitoring, Rural drinking water, Water source

1. INTRODUCTION

Due to the fast-growing urbanization supply of safe drinking water is a challenge for every city authority. Water can be polluted any time. So the water we reserved in the water tank at our roof top or basement in our society or apartment may not be safe. Still in India most of the people use simple water purifier that is not enough to get surety of pure water.

Sometimes the water has dangerous particles or chemical mixed and general-purpose water purifier cannot purify that. And it is impossible to check the quality of water manually in every time. So an automatic real-time monitoring system is required to monitor the health of the water reserved in our water tank of the society or apartment. So it can warn us automatically if there is any problem with the reserved water. And we can check the quality of the water anytime and from anywhere. By keeping this mind we designed this system especially for residential areas. By integrating IoT sensors with cloud computing, this system offers a robust and scalable approach to continuously track various water quality parameters—such as pH, turbidity, dissolved oxygen, temperature, and chemical contaminants—over vast geographic areas, without the need for manual sampling.

The combination of IoT sensors and cloud platforms enables remote, automated monitoring, allowing for instant data collection, analysis, and reporting. This real-time capability ensures that pollution levels can be detected early, enabling timely intervention to protect water resources. Furthermore, the cloud integration facilitates easy access to data for stakeholders such as environmental agencies, researchers, and the public, promoting transparency and informed decision-making .

This paper explores the design and implementation of an IoT-based water pollution monitoring system, highlighting its potential for real-time applications in pollution detection and management. The system leverages modern cloud computing technologies to store and analyze data, ensuring seamless operation and scalability. Through this innovative approach, we aim to contribute to more effective water quality management and, ultimately, a cleaner and healthier environment for all.

2. LITERATURE SURVEY

2.1 Motivation

Using water intake metering facilities which installed by the water intake households permitted by the Changjiang water resource commission ,or using other methods, we collect water intake data, and the water intake data acquisition device transfer the data collected into digital signals using installed different programmed module according to the type, port of the measurement facilities and different installed conditions. So the water intake information collection subsystem can realize automatic acquisition and monitoring the water intake data. Generally it can collect water intake data once an hour. It has three methods to intake water:The system can periodically detect the water quality and the important indicators of the soil in the rural water sources, and combine the water pollution.

2.2 Problem statement

Due to the fast growing urbanization supply of safe drinking water is a challenge for the every city authority. Water can be polluted any time. So the water we reserved in the water tank at our roof top or basement in our society or apartment may not be safe. Still in India most of the people use simple water purifier that is not enough to get surety of pure water. Sometimes the water has dangerous particles or chemical mixed and general purpose water purifier cannot purify that. And it's impossible to check the quality of water manually in every time. So an automatic real-time monitoring system is required to monitor the health of the water reserved in our water tank of the society or apartment. So it can warn us automatically if there is any problem with the reserved water. And we can check the quality of the water anytime and from anywhere. By keeping this mind we designed this system especially for residential areas.

3.PROPOSED SYSTEM

Working of the project:

In the project we are monitoring the parameters of the waters and thus water quality is monitoring. Arduino uno is the main controller of the project. Project is about the monitoring the Ph of the water, turbidity, temperature of the water.Turbidity is a measure of the clarity of water. Water that has a very high turbidity will appear cloudy or opaque while water with very low turbidity will appear clear or translucent. To measure the turbidity , turbidity sensor is used. Temperature and PH of the water should be in range thus , tempreture sensor and PH sensor is used

to measure temperature and PH level of water respectively. This all data will collect on the colude and we get the location from where we are measuring this data.

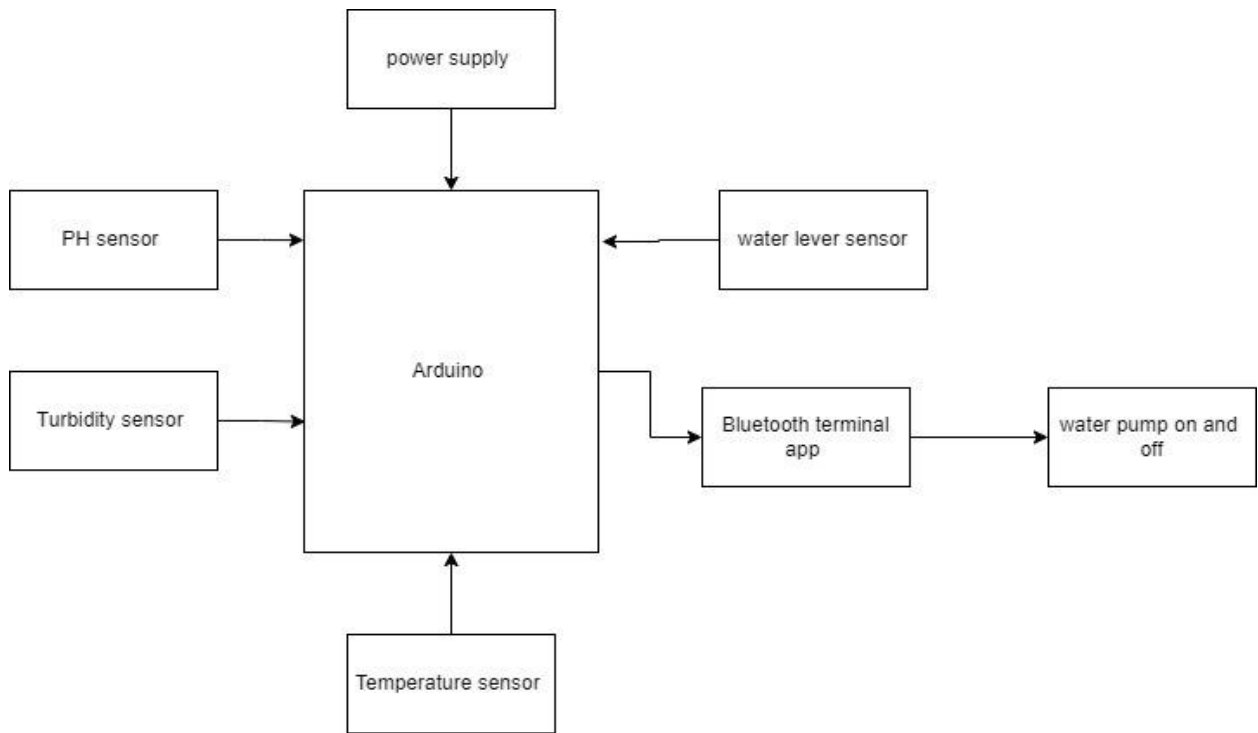


Fig 3.1:Block Diagram

3. CONCLUSIONS

In conclusion, this project demonstrates the practical application of IoT in environmental monitoring, making it a cost-effective, scalable, and efficient solution for ensuring water quality in rivers, lakes, industrial discharge points, and other critical water bodies. Future enhancements can include AI-based predictive analytics, machine learning for anomaly detection, and automated water treatment solutions


4. REFERENCES

1. Wawan Purwanto, "A quarter of villages in Indonesia are affected by river pollution".
2. Robertus Haryoto Indriatmoko, "Online River Water Quality Monitoring System Planning", Journal of Environmental Engineering, Jakarta: BPPT. Vol. 10, No. 1, 2017 pp. 25-32.
3. Muhammad Rizqi Zulkarnaen, "River Water Quality Monitoring System Equipped with Data Loggers and Wireless Communications as Media for Monitoring Liquid Waste".
4. Ahmad Sabiq, "Monitoring System for pH, Temperature, and Color in River Water through a Web-based Wireless Sensor Network", Journal of Technology and Computer Systems, Semarang: UNDIP. 5 (3), 2017 pp. 94-100

5. Olankule Elijah, “ A Concept Paper on Smart River Monitoring System for Sustainability in River”, International Journal of Integrated Engineering, Malaysia: Universiti Tun Hussein Onn Malaysia Publisher’s Office. Vol. 10, No. 7. 2018,pp 130-139.
6. Jincun Liu, Zhengxing Wu, Junzhi Wu,” Design and Implementation of a Robotic Dolphin for Water Quality Monitoring”, IEEE International Conference on Robotics and Biometrics. China: IEEE. 2016.
7. Andrew David Thaler, “Robot as vectors for marine invasions: Best practices for minimizing transmission of invasive species via observation-class ROVs”, Tropical Conservation Science, USA: Vol. 8, No. 3, 2015 pp. 711-717.
8. Youyou ,”Analog pH meter kit SKU: SEN0161“,[Internet]. DFRobot 2017. Cited at: 2020 August 1.
9. DFRobot, ”SEN0244 Gravity Analog TDS Sensor Meter For Arduino“.

BIOGRAPHIES

	<p>Assistant Professor- Mrs. Roshani Gawande , Department of Electronics and Telecommunication Engineering, PVPIT, Pune</p>
	<p>Student – Ms.Sarika Mare, Department of Electronics and Telecommunication Engineering, PVPIT, Pune.</p>
	<p>Student- Mitali Kenjale, Department of Electronics and Telecommunication Engineering, PVPIT, Pune.</p>

 A portrait photograph of a young woman with dark hair, wearing a light blue patterned top, set against a red background. The photo is mounted on a white card.	<p>Student- Shrutika Kamble, Department of Electronics and Telecommunication Engineering, PVPIT, Pune.</p>
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