WATER QUALITY ANALYZING AND INTIMATION TOOL

Mohan S
AP/ECE,
AVS Engineering college,
Salem, Tamilnadu, India.
smohhanbe@gmail.com

Soundarraj S
Department Of ECE,
AVS Engineering college,
Salem, Tamilnadu, India.
soundarraj2112001@gmail.com

Vasanthakumar S
Department Of ECE,
AVS Engineering college,
Salem, Tamilnadu, India.
vasanthbe473@gmail.com

Vinothraj M
Department Of ECE,
AVS Engineering College,
Salem, Tamilnadu, India.
vinoth74490@gmail.com

Vivek C
Department Of ECE,
AVS Engineering College,
Salem, Tamilnadu, India.
vivekc9750@gmail.com

ABSTRACT

Access to drinkable water and poses a challenge to test water quality. On-site early detection and warning technologies are a powerful tool for accurate water quality pollutant risk assessment. The polluted water can cause various diseases to humans and animals, which in turn affects the life cycle of the ecosystem. If water pollution is detected in an early stage, suitable measures can be taken and critical situations can be avoided. Also, we have implemented a water monitoring platform, there water data is registered for rural communities in open data access. The water probe is sensor measurements are visualized through a web platform making them easier to understand. Then, data were collected on field and the parameters are measured within the accepted range for drinking water standards, with a cost-effective.

Keywords

Quality,Detection,Polluted,Ecosystems,Measures, Probe,Monitoring,Parameters,Cost-effective .

1.INTRODUCTION

Water pollution ensues when lethal materials move into water sources like ponds, rivers, lakes, seas and oceans, gets dissolved and suspends in water or gets deposited on the bed. Pollution will degrade the quality and purity of water. Ensuring pure and safer water is really challenging due to undue sources of chemicals and contaminants. Pollution of water can be instigated by numerous ways; one of the main reasons for pollution is industrial waste discharge and city sewage. Secondary sources of pollution are pollutants that enter the water from soils or from atmosphere via rain or from groundwater systems. Usually, soils and groundwater comprises of residues of modern practices in agriculture and also indecorously disposed wastes from industries. The major pollutants of water include viruses, bacteria, fertilizers, parasites, pharmaceutical products, pesticides, nitrates, fecal waste, phosphates radioactive substances and plastics. Apart from food, oneof the most basic need for any person is clean drinking water.So, it is one of the most critical aspects of smart water management to ensure that the water is clean and clear for usage by any individual. So various sensors are integrated to check the quality of water. The readings from various sensorsprovides the information like turbidity of water, TDS in water, electrical conductivity, pH . It helps in the real-time analysis of water eminence in any location and resolve any issue present, thereby saving the health and lives of people.

2.RELATED WORK:-

1."An Intelligent Water Quality Monitoring System Based on Wireless Sensor Networks" by H. Zhang, et al.: This paper proposes a wireless sensor network (WSN) based water quality monitoring system. The system consists of a number of sensor nodes which are deployed in the water bodies to collect various water quality parameters such as temperature, pH, dissolved oxygen, etc. The collected data is transmitted to a remote server through a gateway node where it is analysed and visualized.

2."A Hybrid Method for Water Quality Prediction Using Machine Learning and Statistical Models" by J. Zhang, et al.: This paper proposes a hybrid method for water quality prediction by combining machine learning and statistical models. The authors use principal component analysis (PCA) to select the most relevant input variables and then use support vector regression (SVR) and artificial neural network (ANN) models to predict water quality parameters.

3."Water Quality Monitoring System Based on Internet of Things" by S. Kim, et al.: This paper

proposes an Internet of Things (IoT) based water quality monitoring system. The system consists of a number of sensor nodes which are deployed in the water bodies to collect various water quality parameters. The collected data is transmitted to a cloud server through a gateway node where it is analyzed and visualized.

4."Water Quality Monitoring and Control System Based on Wireless Sensor Networks" by L. Liu, et al.: This paper proposes a wireless sensor network (WSN) based water quality monitoring and control system. The system consists of a number of sensor nodes which are deployed in the water bodies to collect various water quality parameters. The collected data is transmitted to a remote server through a gateway node where it is analyzed and visualized. The system also includes a control module which can adjust the water quality parameters by controlling the actuators.

5."A Comparative Study of Machine Learning Techniques for Water Quality Prediction" by S. N. Nwankwo, et al.: This paper presents a comparative study of various machine learning techniques for water quality prediction. The authors compare the performance of linear regression, decision tree, k-nearest neighbour, support vector machine, and artificial neural network models for predicting water quality parameters. They also use feature selection techniques to select the most relevant input variables.

3.PROPOSED SYSTEM

The Water Quality Analyzing and Intimation Tool is the project that aims to develop a system for monitoring and analyzing the quality of water in real-time.This project presents a accessible water quality probe to measure four physico-chemical parameters: pH, dissolved oxygen, electrical conductivity, and bacteria using co-design community methodology.To improve water quality management and ensure safe and healthy water for communities we propose this concept.This project has the potential to bring significant benefits, including improved public health, reduced environmental damage, and more effective and efficient water management.

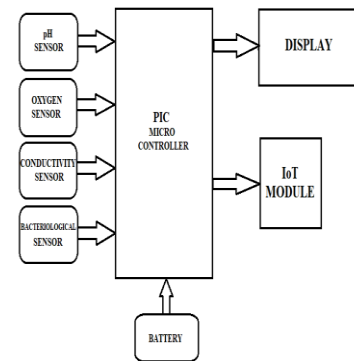## 4. BLOCK DIAGRAM AND WORKING:-

Fig 4. Block Diagram

This project presents a accessible water quality probe to measure four physio-chemical parameters: pH, dissolved oxygen, electrical conductivity, and bacteria using co-design community methodology. All the datas from are read by PIC microcontroller, where it is analyzed using Internet of Things to detect potential water quality issues The tool sends alerts and notifications to relevant stakeholders when water quality issues are detected, providing critical information that can help prevent health hazards and environmental damage by using IOT module.

4.1 PIC MICROCONTROLLER

PIC stands for "Peripheral Interface Controller" and they are widely used in a variety of applications, including industrial control, consumer electronics and more.PIC microcontroller use a modified Havard Architecture, which seperates program and data memory.The Instruction set of PIC microcontroller is a RISC-based instruction set.PIC microcontrollers have various types of memory, including program memory, data memory and EEPROM memory.

Fig 4.1 PIC Microcontroller

4.2 PH SENSOR

Which device is used to measure the amount of alkalinity and acidity in water.This sensor pH range is 0 to 14.Here 7 is neutral.

Fig 4.2 pH Sensor

4.3 OXYGEN SENSOR

Which is used to measure level of oxygen in a gas or liquidate accuracy of the sensor should be high enough to provide reliable data.The sensor should be designed to withstand the harsh conditions of water environment.

Fig 4.3 Oxygen Sensor

4.4 CONDUCTIVITY SENSOR

Which is a device used to measure the ability of water to conduct electrical current, which is related to the concentration of ions in the water.The sensitivity of the sensor should be high enough to detect small changes in conductivity levels.The accuracy of the sensor should be high enough to provide reliable data.

Fig 4.4 Conductivity Sensor

4.5 BACTERIOLOGICAL SENSOR

Which is a device used to detect the presence and concentration of bacteria in water.The sensitivity of the sensor should be high enough to detect small concentration of bacteria. The sensor should be designed to withstand the harsh conditions of water environments, including fouling and biofouling.

Fig 4.5 Bacteriological Sensor BLV5

4.6 INTERNET OF THINGS

IoT can be used in heart disease prediction through the use of wearable devices that collect data on a person's heart rate, blood pressure, and other vital signs. transmit this data to healthcare providers in real-time. providing more accurate and timely data, enabling earlier detection and intervention, and improving communication and collaboration between patients and healthcare providers.

4.6.1 IOT MODULE

Which is a device used to connect physical devices and sensors to the internet, allowing for remote monitoring and control module should have built in security features such as data encryption and authentication. Which should be designed to fit with in the physical constraints of device or sensors.

4.CONCLUSIONS

Water Pollution is a major threat to any country, as it affects health, economy and spoils bio- diversity. In this work, causes and effects of water pollution is presented, as well as a comprehensive review of different methods of water quality monitoring and an efficient IoT based method for water quality monitoring has been discussed. Although there have been many excellent smart water quality monitoring systems, still the research area remains challenging. This work presents a review of the recent works carried out by the researchers in order to make water quality monitoring systems smart, low powered and highly efficient such that monitoring will be continuous and notifications will be sent to the concerned authorities for further processing.

The developed model is cost effective and simple to use (flexible). four water samples are tested and based on the results, the water can be classified whether it is drinkable or not.

5.REFERENCES

1. A. Saad, A. E. H. Benyamina and A. Gamatié, "Water Management in Agriculture: A Survey on Current Challenges and Technological Solutions," in IEEE Access, vol. 8, pp. 38082-38097, 2020, doi: 10.1109/ACCESS.2020.2974977

2.Tejesh B.S.S., Begum M.S., Mayuri N., Neeraja S., Purvaja Durga B. (2019), 'A novel smart city using IoT and open source technology', International Journal of Engineering and Advanced Technology, 8(6),PP.4633-4637

3.A. Joshi, I. Dandekar, N. Hargude, A. P. Shrotri and A. R. Dandekar, "Application of Internet of the Things(IOT) for the Water Conservation and Entrepreneurship in the Rural Area," 2019 IEEE Pune Section International Conference (PuneCon), Pune, India, 2019, pp. 1-4, doi: 10.1109/PuneCon46936.2019.9105807

4.D. Mishra, A. Khan, R. Tiwari and S. Upadhay, "Automated Irrigation System-IoT Based Approach," 2018 3rd International Conference On Internet of Things: Smart Innovation and Usages (IoT-SIU), Bhimtal, 2018, pp. 1-4, doi: 10.1109/IoT-SIU.2018.8519886

5.Chowdary T.A., Chakravarthy D.V., Rupesh R.V.S., Ashish T.S.C., Charan V.H.S. (2019), 'Effective implementation of low-cost smart irrigation system', International Journal of Innovative Technology and Exploring Engineering, 8(6), PP.1805-1810.