LITERATURE SURVEY ON REAL-TIME RIVER WATER QUALITY MONITORING AND CONTROL SYSTEM

Water is the primary need of all living beings and living without water is impossible. With the advancement of technology and industrialization, environmental pollutions have become a major concern. Water pollution is one of the most serious types of this environmental pollution. Our lives depend on the quality of water that we consume in different ways, from juices which are produced by the industries. Any imbalance in the quality of water would severely affect the humans health and at the same time it would affect the ecological balance among all species. Water quality refers to the chemical, biological, radiological, and biological parameters of the water.

The essential parameters of the water quality vary based on the application of water. For example, for aquariums, it is necessary to maintain the

- Temperature
- pH level
- dissolved oxygen level
- turbidity
- the level of the water

in a certain normal range in order to ensure the safety of the fish inside the aquarium. For the industrial and household applications, however, some parameters of the water are more essential tobe monitored frequently than the others, depending on the usage of the water.

J . Navarajan : This research paper focuses on Detection on water pollution and water management using **smart sensors IOT** .To ensure the safe supply of drinking water the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed .This system consists some sensors. Which measure the water quality parameter such as pH, turbidity, conductivity, dissolved oxygen, temperature. The measured values from the sensors are processed by microcontroller and these processed values are transmitted remotely to the core controller that is raspberry pi using Zigbee protocol . Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality

parameters in real time. Based on a study of existing water quality monitoring system and scenario of water we can say that proposed system is more suitable to monitor water quality parameters in real time.

NatasaMarkovic : this research paper focuses on **Sensor Web** for River Water Pollution Monitoring and Alert System Sensor Web has provided infrastructure for collecting and processing data from distributed and heterogeneous sensors. This set of technologies has found various implementations, especially in the area of environmental monitoring. The Sensor Web architecture for crisis management, described in this paper, provides active monitoring of measuring parameters and timely responses in cases of environmental disasters. The River Water Management and Alert System built on this architecture enable access, control and management of river water pollution.

K. A. UnnikrishnaMenon : This research paper focuses on **Wireless Sensor Network** for River Water Quality Monitoring in India This paper introduces a river water quality monitoring system based on wireless sensor network which helps in continuous and remote monitoring of the water quality data in India. The wireless sensor node in the system is designed for monitoring the pH of water, which is one of the main parameters that affect the quality of water. Wireless sensor Network which aids in River Water Quality Monitoring. This paper also proposes a novel technique for the design of a water quality sensor node which can be used for monitoring the pH of water.

(a)**Temperature:** The p value of the parameter 0.001 was less than α value of 0.05, so null hypotheses can be rejected.

(b)**DO:** The p value of the parameter 0.000 was less than α value of 0.05, so null hypotheses can be rejected.

(c)**Conductivity:** The p value of the parameter 0.010 was less than α value of 0.05, so null hypotheses can be rejected.

(d)**BOD:** The p value of the parameter 0.001 was less than α value of 0.05, so null hypotheses can be rejected.

(e)**Nitrate:** Because the p value of the parameter 0.000 was less than α value of 0.05, null hypotheses can be rejected.

(a)Temperature in summer, rainy and winter in each of the stations: The observation suggests that for sample, there is a significant difference in F and F-critical value and also the P value is very small as compared to alpha value (0.05).

(b)For columns, though there is no much difference in F and F-critical values, P value is smaller than alpha value.

(c)The interaction shows that as independent parameter the temperature is not acceptable because there is a huge variation in F value and F-critical values as well as P value; it is acceptable as a group because there is no much difference in F value and F-critical values.

(d)DO shows that neither as the independent variable nor as a group the prediction cannot be accepted because there is a huge difference between F and F-critical values for sample, for columns nor for interaction; also the P value is much lesser than alpha value.

(e)pH when considered as only sample: It is not acceptable because there is a huge difference between F and F-critical values; otherwise, it is accepted as columns and interaction as F and F-critical and P value are within range.

(f)Conductivity parameter is bound to create an exception because all the critical attributes, i.e., F, F-critical and P value are significantly not acceptable.

(g)BOD as an interaction between sample and columns is only acceptable because F and F-critical values are in acceptable range, otherwise as an independent variables F, F-critical and P value differ significantly.

(h)NO3 shows that neither as the independent variable nor as a group, the prediction can be accepted because there is a huge difference between F and F-critical values for sample, columns and interaction; also the P value is much lesser than alpha value.

(i)TDS shows that neither as the independent variable nor as a group, the prediction can be accepted because there is a huge difference between F and F-critical values for sample, columns and interaction; also the P value is much lesser than alpha value.

An IoT system was developed to monitor river Krishna in real time. The IoT system was used to collect the data from identified stations for different water quality parameters such as pH, turbidity, DO, BOD, NO3, temperature and conductivity to generate a data set that was used to monitor the quality of water. The collected data were successfully utilized to assess the water quality of river Krishna using one-Way ANOVA which analyze a particular parameter and predict the quality based on value obtained. Two-way ANOVA was used to do the analysis of two parameters as a single entity as well as a combination of two parameters.

The results showed that one-Way ANOVA was best suited for training the IoT system. The observations showed that all the water quality parameters play a vital role in one or the other seasons. In summer season, the parameters conductivity and TDS were found to be more concentrated due to low water level in the river and the water quality was 30.39%. In rainy season, the water quality was 65.37% and the parameter affecting the water quality was DO. In winter seasons, DO was the parameter which affected the water quality and the water quality was 46.47%. The collected data set can also be used in future to make the system intelligent by applying machine learning techniques.