**LITERATURE SURVEY**

**Real-Time River Water Quality Monitoring and Control System**

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The implementation of a robust and cost-effective water monitoring system demands a good level of research and development. Many researchers have proposed different models in order to implement such a system.

* Mohammad Salah Uddin Chowdury et al. [1] have proposed a system for monitoring the quality of water in a river with the aid of an embedded system consisting of wireless sensor network and IoT. Deep learning models have been used to assess the quality of water and SMS alert is sent in case the value of a sensor has crossed the threshold.
* Soundarya Pappu et al. [2] have used a pH and a TDS sensor to determine the quality of water with the Arduino microcontroller and the Raspberry Pi3. K-means clustering algorithm is used to predict the quality of water based on the sensed values.
* Thinagaran Perumal, Md Nasir Sulaiman and Leong.C.Y [3] have implemented a system to monitor water level with IoT. The water level is measured using a sensor and is fed to a web-based dashboard. Twitter is used for sending necessary alerts to the users.
* Nikhil Kumar Koditala and Purnendu Shekar Pandey [4] have devised a model for regulating the temperature of water by predicting the temperature of the surrounding environment using machine learning. Besides, the quality of water is analyzed by sensors measuring pH and turbidity. The data is stored in Azure Event Hub and PowerBI is used for displaying the values obtained from the sensors.
* Juan Huan et al. [5] have used STM32L151C8 microcontroller for real-time monitoring of temperature, dissolved oxygen and pH of a water sample. A cloud-platform is designed using Java for real-time monitoring.
* Abbas Hussien Miry and Gregor Alexander Aramice [6] have used ThingSpeak for monitoring and analysis of the TDS and Turbidity of water. When the values of these parameters are not within a normal range, a warning message is notified to the user through IFTTT.
* Yiheng Chen and Dawei Han [7] have depicted how a water management system can be implemented through IoT in urban areas for developing a smart city. They have measured different parameters of water like dissolved oxygen, turbidity, pH and conductivity and have also employed a camera system to get a video of the surface of water.
* Sathish Pasika and Sai Teja Gandla [8] have devised an IoT system based on the ThingSpeak application for water quality monitoring. An Arduino Mega and NodeMCU microcontrollers are used to process the readings from the sensors and upload them to the ThingSpeak server.
* Tongxin Shu et al. [9] have developed an energy efficient system for automatic water quality monitoring. They have applied a data-driven adaptive sampling algorithm (DDASA) in order to the efficiency of power consumption while acquiring the turbidity and dissolved oxygen of water.

Kamarul Hafiz Kamaludin and Widad Ismail [10] have used RFID and wireless sensor networks to perform real time monitoring of a lake. The 920MHz Digi-mesh protocol is used for its unique property of surpassing the signal attenuation.