

## **Project Objective:**

Remote monitoring and Internet of Things (IoT) technology can be used to access real-time data. With the aid of Spark streaming analysis through Spark MLlib, Deep learning neural network models, the belief rule based (BRB) system, and standard values comparison, data collected at the separate site can be shown in a visual way on a server PC. Additionally, it guarantees affordable and effective river water quality monitoring and management. Since the system is battery-powered, it is considerably safer for the community and its inhabitants to use river water that has a low rate of electrical shocks because the battery is totally insulated and rechargeable. People may forecast and analyse the hardness of water as well as other variables like water temperature and turbidity using this device, resulting in water that is safe to drink and has better consistency for household uses. Since water is a necessary component of our everyday lives, our market-competitive, cost-effective quality monitoring and control system ensures that we may all consume it in a healthy way. It also considerably reduces the risk of death for those who use river water. There are five main components of the environment: soil, water, climate, native plants, and landforms. The most important of these for human life is water. Additionally, it is essential for the survival of other living ecosystems. Water that is safe and easily accessible is essential for maintaining public health, regardless of whether it is utilised for drinking, domestic uses, food production, or pleasure. Water that is safe and easily accessible is essential for maintaining public health, regardless of whether it is utilised for drinking, domestic uses, food production, or pleasure.

Therefore, it is crucial for us to keep the balance of water quality. Otherwise, it would seriously harm human health while also disrupting the natural balance among other species. Water pollution is a major global issue that necessitates continual assessment and adaption of the guiding principles for managing water resources from the global level down to individual wells. According to studies, water contamination is the main global cause of deaths and diseases.

Records indicate that water contamination causes more than 14,000 deaths each day worldwide. Untreated water that is contaminated or unclean is frequently used for drinking in impoverished nations. One of the causes of this is the public and administrative illiteracy, as well as the absence of a system to check the quality of the water, which poses major health risks.

In this research, we present a Wireless Sensor Network (WSN) design that makes use of data collected by sensors submerged in water to help monitor water quality. This system can measure a number of properties in water, including pH, dissolved oxygen, turbidity, conductivity, temperature, and others, using a variety of sensors. Real-time data capture, transmission, and processing now have a fresh method thanks to the quick development of WSN technology.

Customers can access up-to-date information on water quality from a distance. The Internet of Things (IoT) is a cutting-edge technical development today. It is influencing the way the world is now and is utilised in many different fields to gather, monitor, and analyse data from far-off places. Smart cities, smart power grids, smart supply chains, and smart wearables are all part of the IoT integrated network. IoT has a lot of potential, even though it is presently underutilised in the environmental field. It can be used to avoid landslides and avalanches, minimise air pollution, monitor snow levels, and identify forest fires and early earthquakes. Additionally, it can be used as a monitoring and control system for water quality.

Researchers' interest in water quality monitoring has increased in the twenty-first century. Numerous works on this subject, concentrating on different facets of it, are either completed or in progress. The development of an effective, affordable, real-time system for monitoring water quality that incorporates wireless sensor networks and the internet of things was the overarching goal of all the initiatives.

In this study, we use an IoT-based sensor network to continuously track the physical and chemical characteristics of water bodies inside Chittagong city.