

## ABSTRACT

A Smart IoT-Based Rural Water Supply Monitoring and Controlling System is designed to ensure efficient water distribution while maintaining quality standards using IoT-based automation. The system employs an Arduino Uno as the microcontroller, ESP8266 for wireless communication, and Blynk IoT platform for remote monitoring and control. A total dissolved solids sensor assesses water quality before activating the submersible water pump to fill the harvest tank. If the water quality is below the threshold, the motor remains off until purification. A valve solenoid, controlled via a relay module, regulates water transfer from the harvest tank to the distribution/storage tank based on demand. A flow sensor monitors water movement, ensuring detection of leakages. A water level sensor categorizes storage levels as empty, low, medium, and high, triggering corresponding LED indicators and a buzzer for alerts. The system integrates a relay module to control two motors efficiently. Real-time data on water level, total dissolved solids value, and flow rate is transmitted to the cloud via ESP8266, enabling remote monitoring and automated control. This solution enhances rural water management by ensuring optimal utilization, reducing wastage and providing a scalable, IoT-driven approach to water supply automation.