

ABSTRACT

*Water is a vital natural resource but is vulnerable to pollution and quality degradation. With the increase in population and urbanization, pressure on water resources is growing, especially from industrial, household, and public facility waste such as that from canteens. If not properly managed, this waste can contaminate water and harm ecosystems. One sustainable solution is the use of banana stems (*Musa Paradisiaca*) to filter pollutants from waste. Banana stems, rich in fiber and porous, are effective in absorbing pollutants and purifying water, offering an eco-friendly alternative.*

This project integrates Internet of Things (IoT) technology to monitor the effectiveness of banana stems in treating canteen waste. With pH sensors, TDS sensors, DS18B20 temperature sensors, and the ESP32 microcontroller, water quality can be measured in real-time, ensuring its suitability before being released into the environment. This innovation offers a sustainable approach that is easy to implement, particularly in areas with limited access to advanced technology. The research results are expected to provide efficient and eco-friendly solutions for waste management.

Measurement of canteen wastewater using pH, TDS, and temperature sensors showed water quality parameters. pH 7.6 (slightly acidic), TDS 850 ppm (close to the maximum limit), temperature 32°C (slightly high). Regular monitoring is needed to prevent negative impacts on the environment due to pollutants and chemical reactions in the water.

Keywords: *ESP32, pH Sensor, TDS Sensor, IoT, Banana Stems, Waste.*