Water

Real time water availability Dashboard

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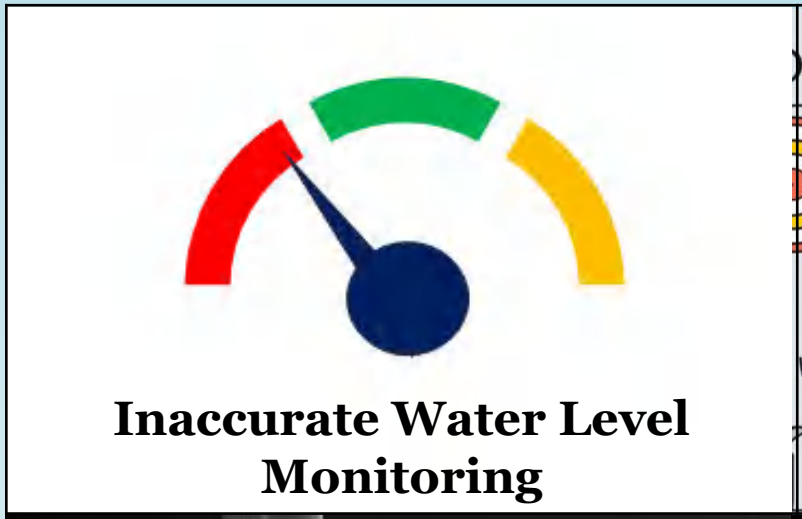
Introduction

- Our project utilizes IoT technology, ultrasonic sound, and TDS sensors, all integrated with an ESP32 microcontroller.
- It aims to provide a comprehensive solution for monitoring water levels and assessing water quality in real-time.
- The system offers cost-effective and efficient water management, detecting issues such as water quality problems and potential leaks.
- It addresses global concerns about water scarcity and quality while ensuring scalability and adaptability through IoT technology.

Problems we handle



Inaccurate Water Level Monitoring

Manual Data Collection

Resource Wastage

Data Accessibility

SOLUTION

COMPONENTS

Components

TDS Sensor

DS18B20WP

HC-SR04

ESP32

Other things

- A TDS sensor, or Total Dissolved Solids sensor, is a device used to measure the concentration of dissolved solids in a liquid.
- It is commonly employed in water quality testing and analysis.

Components

TDS Sensor

DS18B20WP

HC-SR04

ESP32

Other things

- The DS18B20WP is a specific variant of the DS18B20 digital temperature sensor.
- It is designed to measure temperature and provide digital temperature data.

Components

TDS Sensor

DS18B20WP

HC-SR04

ESP32

Other things

- The HC-SR04 is an ultrasonic distance sensor module that is commonly used for measuring distances.
- It operates on the principle of sending and receiving ultrasonic sound waves to determine the distance to an object.

Components

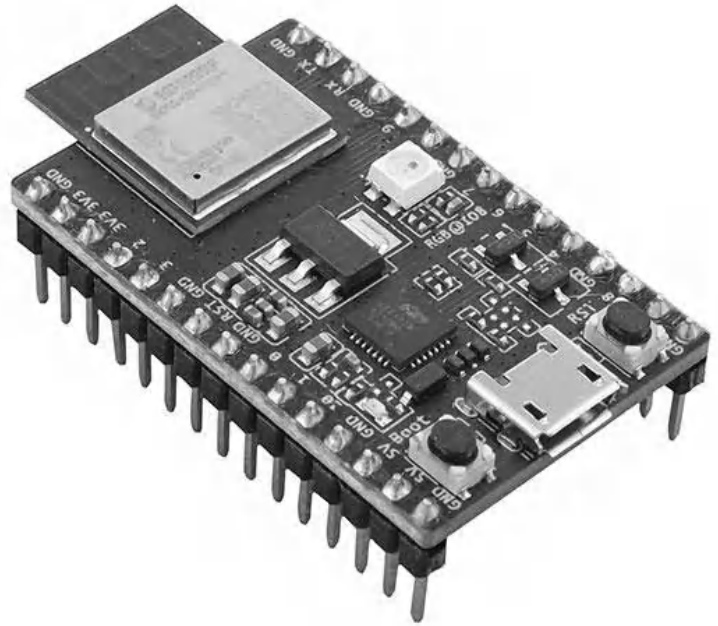
TDS Sensor

DS18B20WP

HC-SR04

ESP32

Other things



The ESP32 is both a microcontroller and a system-on-chip (SoC) that combines a microcontroller unit (MCU) with a Wi-Fi and Bluetooth stack, making it suitable for IoT and wireless communication applications.

Components

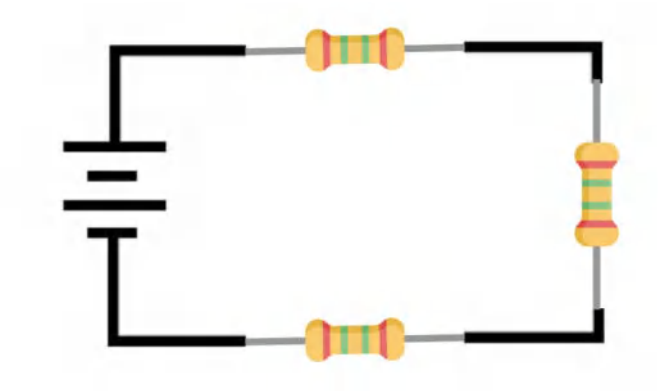
TDS Sensor

DS18B20WP

HC-SR04

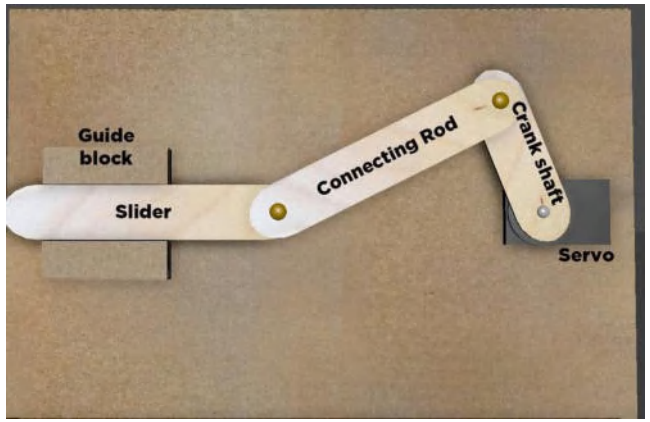
ESP32

Other things



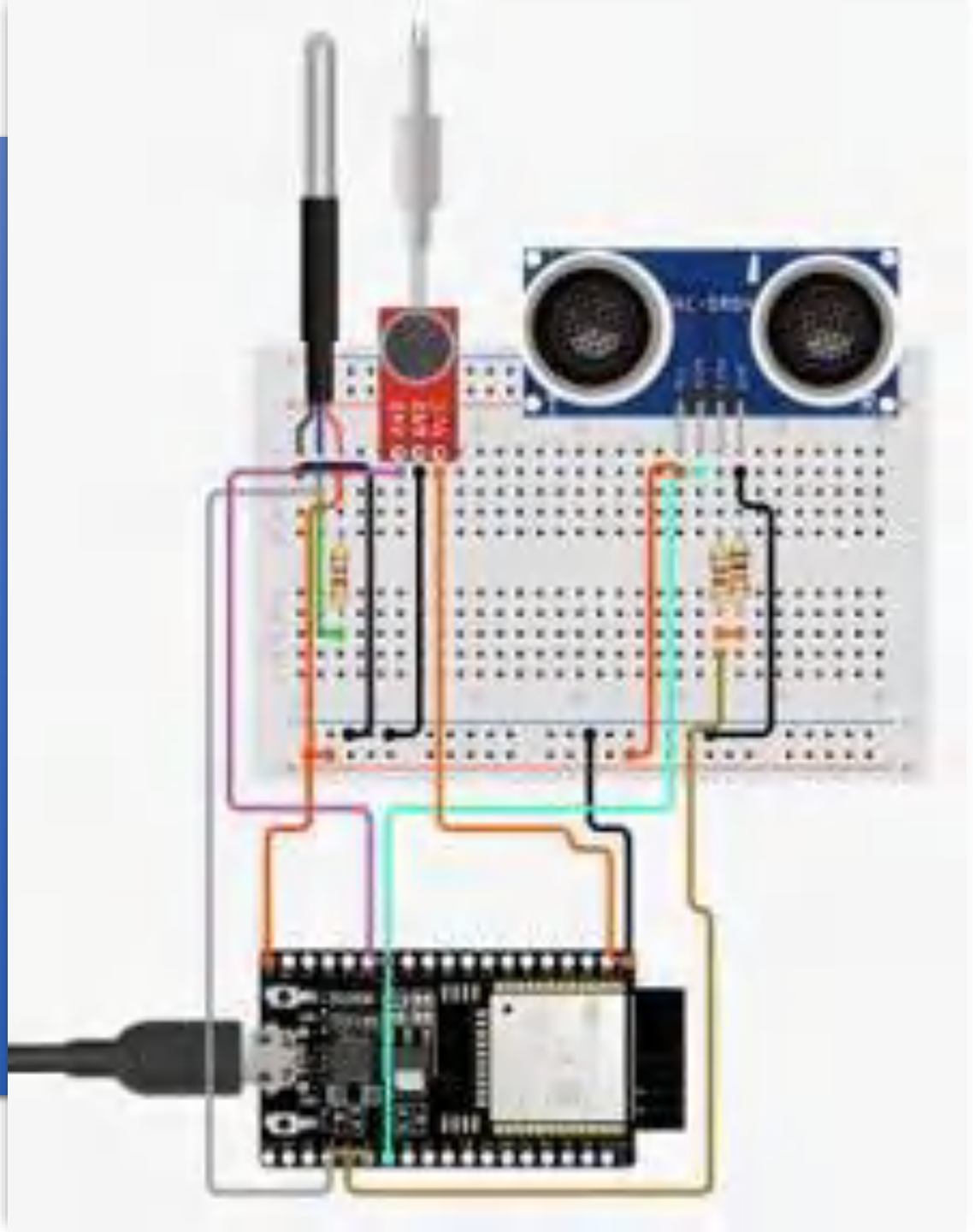
Power supply & 3 Resistors

Plastic box

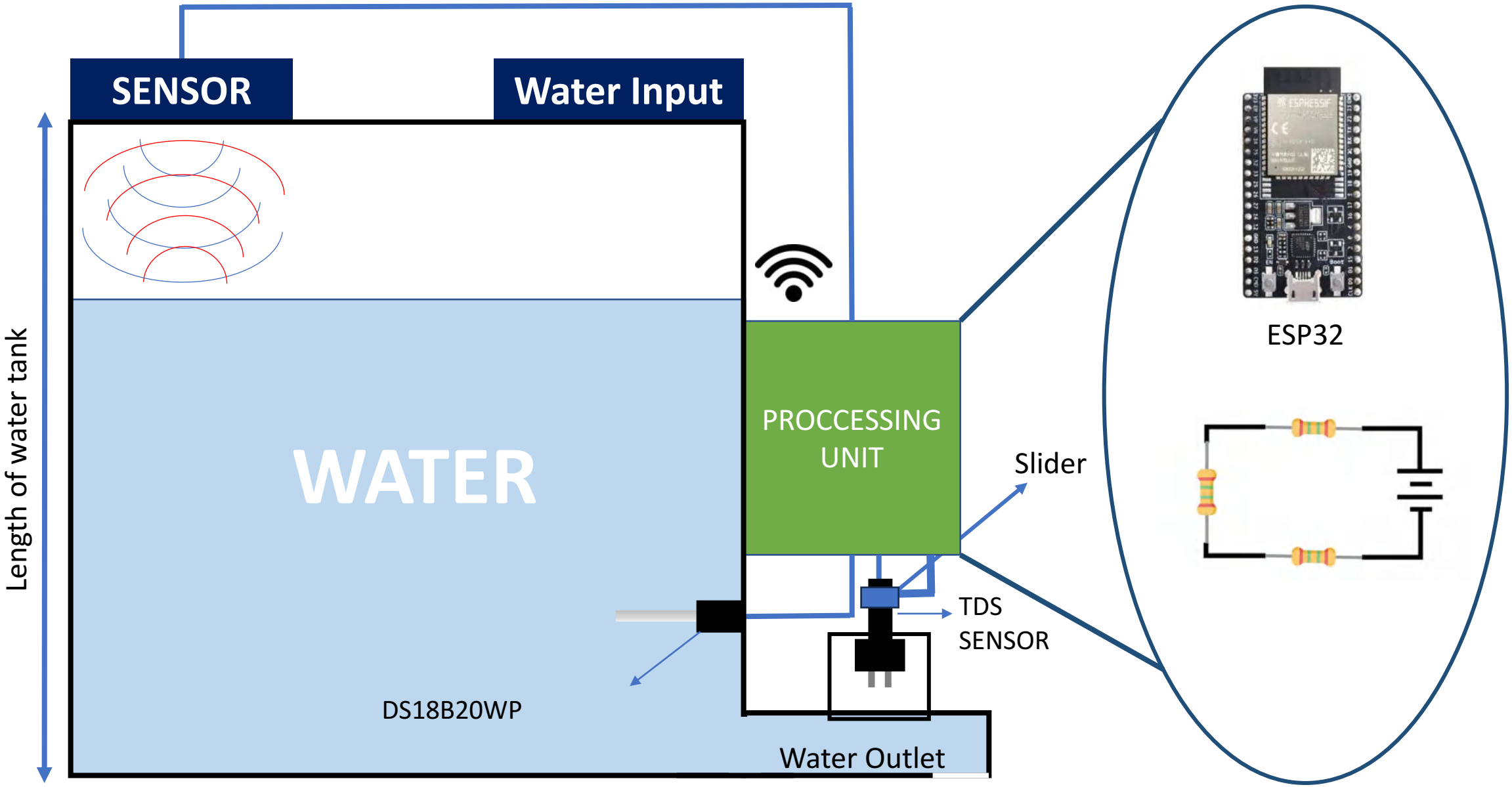


Slider

Circuit diagram



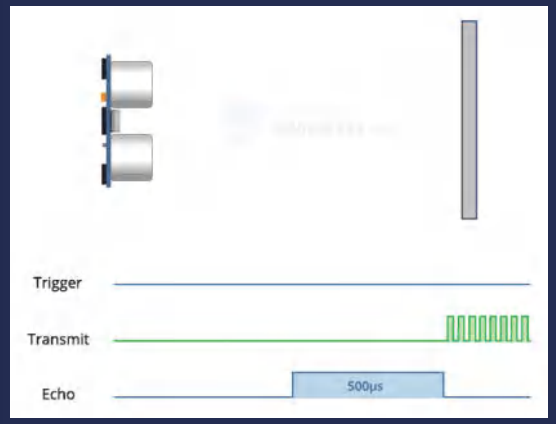
SETUP FOR A WATER TANK



How it’s measured?

WATER availability

The HC-SR04 ultrasonic sensor employs sound waves to precisely measure distances. Operating on a principle of emitting a pulse and subsequently capturing the returning echo, it then employs precise timing calculations to determine the distance. This data is seamlessly relayed to the ESP32 for further processing and analysis, facilitating accurate and real-time distance measurements.



Data collection

Processing

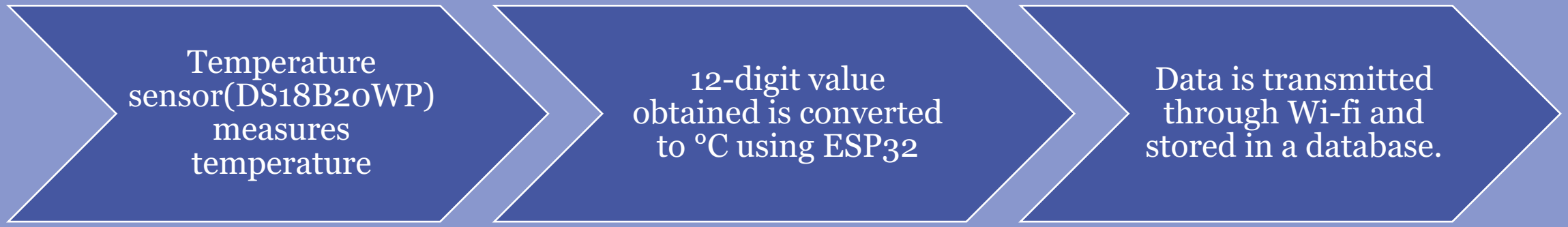
Output

Hardness

A TDS sensor with probes measures dissolved solids in a liquid. It uses electrical conductivity between probes. More solids mean better conductivity. Resistance is measured and converted to a TDS value, usually in ppm or mg/L.

Temperature

The DS18B20WP stands as a waterproof digital temperature sensor distinguished by its individual 64-bit address. Following a temperature conversion command, it meticulously gauges the temperature and transmits a precise 12-bit digital value to the ESP32. Remarkably, this sensor demonstrates exceptional accuracy within a broad temperature range, spanning from -55°C to +125°C.



Processing and Output

- The data collected is processed with the help of ESP32 and storage in a database using Wi-Fi.
- The processed data is creatively displayed on any screen.

Few points to consider

Maintenance

- The Tds sensor probes need to be cleaned after every 10 readings with little detergent and distilled water. If not cleaned it will give incorrect reading as salts get deposited on probe.
- Clean the HCR-S04 and temperature sensor at a stretch of two months otherwise it will cause a coating build-up on the sensor.

Precautions

- The temperature of water should be below 70°C and cannot be used to measure flowing water.

Cost

Component	Cost (price may vary)
TDS Sensor with slider	350
DS18B20WP	200
HC-SR04	50
ESP32	200
Power Supply, Resistors	60

Total :- ₹860

Conclusion

- The device accurately measures temperature, water availability, and water hardness, providing reliable data for a range of applications.
- The system allows for real-time monitoring and data logging, enhancing its usefulness in various scenarios.
- There is potential for even more precise measurements and the inclusion of additional environmental parameters in future developments.
- Our project represents a significant step towards democratizing access to crucial environmental data and contributing to a more sustainable future.

QNA

THANK YOU