

ABSTRACT

The availability of clean water is a basic need that remains a challenge in various coastal areas of Indonesia. Many remote areas lack access to clean water infrastructure, forcing communities to rely on alternative water sources that may not be suitable for domestic use. Abundant seawater cannot be directly utilized due to its high salt and dissolved substance content.

To address these issues, this study designed a portable, evaporation-based desalination system that is automatically controlled using an ESP32 microcontroller. This system involves filling seawater with a pump, evaporating it with a heater, and condensing it to produce fresh water. Temperature is measured using an RTD temperature sensor, while water quality is measured using a TDS sensor. All data can be monitored in real time through the Blynk IoT platform.

The results of this research are expected to make a significant contribution to clean water provision, especially in areas with limited access to clean water sources. The developed portable desalination system is expected to be an effective and affordable solution to the problem of clean water shortages.

Keywords: *sea water, fresh water, desalination, evaporation, IoT, design, sensors.*