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.

4