ABSTRACT

The rapid population growth in Indonesia increases the demand for land and natural resources, making urban farming a potential solution. However, the main challenge in urban farming is automatic, even, scheduled, and measurable fertilizer application. Manual fertilizer application is not effective in terms of energy and time. Therefore, an automatic fertilizer application tool is needed that can increase the efficiency and effectiveness of the fertilization process.

This final project aims to make an automatic liquid fertilizer application tool using an ESP32 microcontroller, LoRa RFM95 module, and a water pump connected to a pH sensor and soil moisture sensor. The system is designed to send soil condition data to the gateway via LoRa communication, which is then displayed on the Blynk application. This tool simplifies the process of applying liquid fertilizer on a scheduled basis, so that plants receive the right nutrients at the right time.

The test results show that this tool can transmit soil condition data well. In the test, the soil moisture value was 54% and the soil pH value was 7.79, indicating that the soil is neutral. The data was taken at 15:00 WIB and can be accessed through the Blynk application. This information about soil conditions makes it easier for farmers to provide proper care, as well as increase efficiency and effectiveness in plant care in the greenhouse.

Keywords: *LoRa, Pupuk, Blynk, Greenhouse*