Design of Automatic Pesticide Spraying System (Green Guardian) Based on Internet of Things (IoT) Using Solar Energy

Fendik Eko Purnomo, S.Pd., M.T. (*Thesis Supervisor*)

Diki Ifnil Mubarok
Study Program of Mechatronic Engineering Technology
Majoring in Engineering

ABSTRACT

This study aims to design and implement an automatic pesticide spraying system based on the Internet of Things (IoT) utilizing solar energy, named Green Guardian. This system is designed to help farmers manage pesticide spraying and watering plants efficiently through remote control using a Firebase-based application. By using the NodeMCU ESP32 microcontroller, the system allows automatic spraying schedules, reducing the need for manual intervention, and increasing farmer work efficiency. Solar panels are used as the main energy source to support an environmentally friendly system and reduce dependence on conventional electricity. The results of functional tests show that this tool can work according to the set schedule, providing flexibility for farmers in crop management. Application testing also shows good communication between the application and Firebase, where spraying data is received correctly according to the specified schedule. It is hoped that the Green Guardian tool can be an innovative solution to increase productivity and efficiency in the agricultural sector.

***Keywords** : Internet of Things (IoT), Automatic pesticide spraying, Solar energy, Green Guardian, Farmer work efficiency.*

.