

“PEDANI (PETANI CERDAS MASA KINI)”

Design and Development of Moisture, Temperature and pH Monitoring Tools on Agricultural Land Based on Monitoring and the Internet of Things to Improve the Welfare of Shallot Farmers in Modo District

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ABSTRACT

Indonesia is a country rich in natural resources. Starting from the agricultural, maritime, forestry, and mining sectors. Indonesia is rich in agricultural products such as rice, soybeans, corn, beans, cassava, tubers, and other spices. Shallots are a spice commodity which is generally consumed as a spice in everyday household cooking. Every yield from a cultivation there will always be a percentage that will fail. The factors that influence crop failure include improper watering, selection of quality seeds, and soil conditions that must be desired. Based on the optimum temperature requirements for the growth of shallots themselves, they prefer to be in a dry environment, in this case shallot farmers are required to water the shallots with the correct dose, which is once a day. Based on the data and problems above, to solve the problem of shallot crop failure, researchers have an innovation entitled "PEDANI (CURRENT SMART FARMERS)", PEDANI is an IoT-based monitoring system that is supported by humidity sensor modules, temperature sensors, pH sensors, and microcontrollers in the form of Raspberry Pi Pico and ESP32 as brains and IoT and Blynk-based data transceivers. The benefit of this research is that it can reduce the failure rate of shallot harvests based on air temperature, soil and air humidity, and soil PH. The research method used in the PEDANI research is quantitative descriptive, the manufacturing process starts with the PEDANI design. Then the collection of tools and materials, testing of each component, next is the determination of parameters and indicators, then installation of all modules to Raspberry Pi Pico, and connecting ESP32 with Raspberry Pi Pico. In this study, to obtain data, the researcher used the Instrumentation method, namely the data from the experimental results would be recorded and analyzed in a modern way. In testing the PEDANI tool, the tool is placed in normal and abnormal soil locations. After the PEDANI test was carried out in normal and abnormal soil conditions, an average accuracy of 96.2% and 95.67% was obtained respectively. In conclusion, it can be written that PEDANI has a high effectiveness value as evidenced by the high accuracy value in reading the condition of shallot farmland both in normal and abnormal conditions.

Keywords: Shallots, Farmers, Monitoring