DESIGN OF AUTOMATED WATERING SYSTEM FOR PALM OIL SEEDLINGS WITH REMOTE MONITORING BASED ON IOT

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ABSTRACT

Based on field observations, several problems were identified that farmers or workers face in performing routine plant maintenance, such as watering seedlings, particularly in palm oil cultivation. The quality of palm oil fruits is crucial, and effective seedling care is one of the key techniques to produce high-quality palm oil seedlings. However, seedling care often faces challenges in watering, as the seedling owners cannot monitor the seedlings constantly. The objective of this project is to develop a tool and mobile application that can automatically and manually control soil moisture and watering based on IoT technology. The ESP8266 is used to manage all hardware and software components, employing a capacitive soil moisture sensor, RTC, and relay. In the control system, users can set the watering schedule for the morning and evening, which can be managed by pressing the on/off button. This tool works by detecting soil moisture levels, which can be monitored via a pc, thereby maintaining the soil's moisture condition. Watering can be controlled both manually and automatically. The test results show that when the soil moisture is below 0-39 %, the pump will activate, and when the soil moisture returns to normal levels between 50-86 %, the pump will automatically turn off.

Keywords: *Watering, IoT, MCU ESP8266, Capacitive soil moisture.*