ABSTRACT

Agriculture plays a strategic role in food security and the economy, but faces challenges such as inflation and crop failure due to climate and pests. This research aims to develop a website-based soil and environmental monitoring system for smart agriculture, utilizing IoT technology. This system provides real-time data regarding agricultural land conditions, such as NPK levels, temperature, humidity and other environmental factors, which are displayed in the form of line and gauge graphic visualizations. Data is collected via IoT sensors and accessed remotely via a website, which applies client-side rendering with stale-while-revalidate in the Next.js framework to revalidate data within a certain time period. Additionally, the system provides an alert notification feature for abnormal parameters and a data download option in excel form. With this system, farmers can manage land more effectively and reduce the risk of crop failure. The implementation of this monitoring system is expected to be able to support more effective and efficient agriculture through accurate and real-time monitoring of soil and environmental conditions.

Keywords: Smart Farming, Monitoring System, Internet of Things, Client-Side Rendering, Stale-While-Revalidate