ABSTRACT

Technological advances can help us overcome obstacles. The food production system depends on several factors, including air quality, water quality, soil quality and weather quality. The quality of air, water, soil and weather is very important in determining food production levels. Climate change affects various food products through various variables, such as changes in crop yields, soil moisture, and water acidity. Global climate change has a negative impact on food production.

Designing an integrated system for smart farming (Smart farming) that measures soil, weather, air quality and air quality. Install a smart farming system that measures soil, air and weather quality using an integrated LoRA-based system. In the sensor node section, LoRA-based air, water, soil and air integration systems for smart agriculture were also tested. building an intelligently integrated agricultural parameter monitoring system. The use of LoRa technology enables long-distance data transmission, so that information from various sensors can be collected and processed in real-time. This data integration provides a better understanding of agricultural environmental conditions, enabling more accurate and timely decision making. In addition, the system also supports two-way communication, allowing users to control and manage agricultural environmental parameters directly.

System integration tools can help agribusiness actors to achieve optimal production results. This system device is able to read the values on each sensor and can take data from each sensor until it is sent to LoRa. From sensor testing, accuracy values are taken from each sensor using a simple linear regression method. For the CCS811 sensor measuring CO_2, it gets an accuracy value of 85.9%, tVOC accuracy value is 4.85%, the BME280 sensor gets 75.01% in the humidity section and gets a value of 94.81% for the sensor accuracy value, the BH1750 sensor gets a value of 99.15%, the anemometer sensor is 95.62%, the rainfall sensor gets a value of 99.92%, the water pH sensor is 89.33%, the TDS sensor is 81.49%, and the temperature sensor or DS18B20 gets a value of 75.05% of results of simple linear regression calculations.

Keywords: Smart Farming, Node Sensor, Integrated System.