ABSTRACT

The increasing need for food and the increasing number of people are not in line with the increasingly limited vacant land, especially in urban areas. One alternative agricultural method that can be a solution is aquaponics. Aquaponics is an advanced agriculture which is a combination of aquaculture and hydroponics. One of the plants that can be used for an aquaponics system is chili. Because chili is one of the leading commodities in Indonesia.

Aquaponics requires special attention in order to get maximum results. Therefore, in this study, we will optimize the aquaponics system by creating a software that can monitor nutrient levels, pond water levels, pH, temperature and humidity in an aquaponic greenhouse environment. The software is also connected to a water level and pH control system which can control the pool water level remotely.

In this final project, 4 types of sensors are used, namely ultrasonic sensors, pH sensors, TDS sensors, and AHT10 sensors. After testing the sensor, the ultrasonic sensor accuracy level is 97%, AHT10 sensor is 98.38% for temperature and 97.36% for humidity, TDS sensor is 92.38% and pH sensor is 96.31%. As for the control system, it uses a peristaltic pump for pH control, a water pump and a solenoid valve for water control. The results obtained that the pH control system works well where the control can control pH levels in the range of 6 - 6.5. For the results monitoring system, the nutrient levels are in the range of 700 – 1000 ppm, pH level 6 – 6.5, water height 20 – 25 cm, temperature 18°C - 40°C, and humidity 60% - 90%.

Kata Kunci: *aquaponic, monitoring, IoT.*