

## ABSTRACT

The demographic bonus experienced by a number of developing countries including Indonesia turned out to have a negative impact in the agricultural sector. This is due to the amount of agricultural land that has been converted into industrial land and residential areas. Therefore, an innovation is needed to reduce the impact of land conversion, one of which is aquaponic cultivation. In aquaponics cultivation, nutrition for plants and water quality become the main concern. One of the parameters of good water quality for aquaponic cultivation is the pH level of the water. This research aims to create a water pH control system in aquaponic plants. This designed system uses an android application and database processing to monitor water quality and control the pH level of the water so that it is stable. The control method used fuzzy logic controller. Set point fuzzy is inputted manually using android application that can used for many aquaponic plant. This research succeeded in making a device that is able to control the pH level of aquaponic water. The results of the pH sensor 1 reading have an accuracy level of  $\pm 0.9861$  and the pH sensor 2 accuracy of  $\pm 0.988$ . The design of the control system using the fuzzy logic controller method is able to present a response time value of 43 seconds. The results of plant growth observations included the number of leaves, leaf length, leaf width, and plant height. Observations were made for 4 weeks to see differences in the growth results of the plants tested. The observed result was that the system using the water pH controller resulted in superior growth in all parameters observed compared to the system that did not use the water pH controller. The process of observing the level and quality of water pH can be seen through an android application using the internet. The pH controlled plants were able to accelerate the growth of leaf length, leaf width, number of leaves, and plant height.

**Key words** – aquaponics, pH, fuzzy logic controller, android application