ABSTRACT

The role of agriculture in urban communities has an important role in helping food security. Agricultural land is getting narrower because of the increasing number of land clearing for agriculture. Aquaponics is a system of planting as well as cultivation which is a combination of aquaculture and hydroponics. In the aquaponics system, it is necessary to control the pH of the water for plants so that plant growth can be optimal. Therefore, it is necessary to make an automatic control system that is able to regulate the pH conditions of the water in the aquaponics system. Automatic control systems need to be made effectively and efficiently. In the automatic control system, real time monitoring is needed so that the data can be observed directly. The control system used is the Fuzzy Logic method. The microcontroller used is Arduino Mega Wifi R3. The processed data will be transmitted to the IoT platform. The plants tested in the system were kale plants while the fish ponds in the aquaponics system were filled with catfish. The pH control test on the aquaponic system was carried out for ten days with four data collection times. The test results average stem diameter was 2.23 mm for the controlled system and 2.13 mm for the system without control, plant height was 147.3 mm for the controlled system and 127.6 mm for the system without control and leaf length was 39, 65 mm for the controlled system and 34.58 mm for the system without the control system, with the control showing thicker diameter, higher plant height and longer leaves than the system without control. Meanwhile, the test results for the average number of leaves were 6.4 leaves for the system without control, indicating that the average number of leaves was more than the control system with an average number of 6 leaves.

Keywords: Fuzzy Logic, IoT Platform, Aquaponics, pH