

ABSTRACT

Aquaponics is an agricultural system that combines aquaculture with hydroponics in a symbiotic environment. Aquaponics can be an alternative that is used in urban areas that have narrow agricultural land. Meanwhile, in conventional aquaponics the monitoring and control system that is carried out is less efficient and optimal because it is prone to measurement errors by humans, especially in meeting nutritional needs and water levels which are the main variables supporting growth.

The development carried out in this research is to combine aquaculture with hydroponics which is then called aquaponics, because the agricultural system that is widely used today only grows vegetables in one container using the hydroponic method. Previous research focused more on monitoring and controlling pH, nutrition and distribution of water levels in the hydroponic method with an on/off control system. The results of previous studies explain that water pump processing in the distribution of clean water from nutrient tanks is very suitable to use the on/off method because the system does not require a fast feedback response.

The results of this study obtained conclusions in the form of. The pH sensor has an accuracy rate of 98.5% with an error of 1.4% and the ultrasonic sensor installed in the system using an exponential weighted moving average filter has an accuracy of 97.2% with an error of 2.7%, so it can be stated that the sensor can run properly. measuring instrument. The pH control system that has been applied tends to be stable in its range with a rise time of 292 seconds and a settling time of 420 seconds. The water level control in the 20 cm range has a fairly accurate and stable value with a rise time of 30 seconds and a settling time of 129 seconds. After 24 hours of observation, the acidity level in aquaponic watering and the elevation level in fish ponds is more often at a predetermined range and makes chili growth in aquaponics optimal.

Keywords: aquaponics, on-off control, chili, tilapia.