

ABSTRACT

One of the important factors affecting the success of tilapia farming is the water quality aspect of the pond, which is reflected in several parameters including temperature, acidity (pH) and ammonia. If these parameters are not stable, it will cause fish to be easily stressed and susceptible to disease. As a result, tilapia productivity will decrease.

In this research, a system is made that can monitor and control temperature, pH, and ammonia automatically. The sensors used are DS18B20 sensor (Temperature), PH4502C sensor (pH), and MQ-137 sensor (Ammonia). Then for the actuators used are fans and pumps as water temperature coolers, heaters as water temperature warmers, pumps connected to pH up / pH down solutions to control pH and Aerators to reduce ammonia levels. This system uses Arduino UNO as the main microcontroller and Wemos D1 Mini as a microcontroller for IoT purposes. The power supply used is an on-grid solar panel power supply.

The results of this study are the system monitors temperature with an error value of 1.15%, pH with an error value of 3.81% and ammonia with an accuracy value of 40% Then the system controls water temperature using a heater with an average temperature increase of 0.003°C and a cooler with an average temperature drop of 0.058 °C, controls pH using a base pump with an average pH increase of 0.5 and an acid pump with an average pH decrease of 0.162, and ammonia levels using an aerator with an average change in ammonia levels of 0.037ppm. After that the data is displayed on a smartphone application using IoT and LCD. As well as an on-grid solar panel power supply that can meet the power needs of 76.1 Watt / hour.

Keywords: *Tilapia, Temperature, pH, Ammonia, Internet of Things, Solar panel, On grid power supply.*