ABSTRACT

The ever-increasing need for food and the growing population are not in line with increasingly limited vacant land, especially in urban areas. One alternative farming method that can be a solution is aquaponics. Aquaponics is advanced farming which is a combination of acculturation and hydroponics. One of the plants that can be used for the 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, this research will create a hardware device to monitor the growth of chili plants. Monitoring the condition of aquaponic plants is generally done by looking at information related to nutrition, pH levels, and water temperature. This information does not represent the real condition of the plants physically, so direct observations must be made to the plant area. Through the camera the height of the chili plants can be measured using image processing. Then in this study an IoT-based chili plant height growth monitoring system using the ESP-32 CAM in the aquaponic planting model is connected via a website which can make it easier to monitor the growth of chili plants.

In this final project research using ESP-32 CAM as the main component. After testing the monitoring system on chili plants with a height of 12 cm, 23 cm, and 25 cm at a distance of 30 cm and 50 cm it was found that the ESP-32 CAM can detect the growth of chili plants at a height of 12 cm with an accuracy rate of 97,50% and at 23 cm high with an accuracy rate of 94,58%. And at a distance of 30 cm between the chili plants and the ESP-32 CAM with an accuracy rate of 97,50%. This is caused by the level of lighting in a room and the condition of the distance between the camera and the chili plants which will affect the process of detecting the size of the chili plants.

Key Words: *Aquaponic, Monitoring, ESP-32 CAM.*