

## **ABSTRACT**

*From year to year land becomes the main problem in farming. One solution about this applying a hydroponic system using the Nutrient Film Technique (NFT) method. This method has the advantage of utilizing circulating water as a planting medium in order to obtain nutrients, oxygen and water so the plant can growth increase with optimal results. In this study, the plants used were kailan plants with a nutritional value of 500-600 ppm in the first week HSS and a pH value of 5.5-6.5 which used as setting point system. To maintain these two values, a fuzzy logic control system is needed using by Arduino Mega 2560 as a Microcontroller, a propeller as a solution stirrer, a water pump DC 12 volt and peristaltic pump DC 12 volt as an actuator. pH sensor and a (TDS) total dissolved solid sensor as input. When the pH value is  $<5.5$  and TDS  $<500$  ppm then buffer pH up (kalium hidroksida) pump and TDS up (nutrient AB mix) pump are actived but when the pH value is  $>6.5$  and TDS  $> 600$  ppm then buffer pH down (asam fosfat) pump and TDS down (raw water) pump are actived until both values match the setting point which getting help of an active stirrer every 20 seconds. In testing the pH sensor and TDS sensor, the error value is minimal. The average error of the pH sensor is **0.078** with an accuracy of **99.92%**. The average error of the TDS sensor is **5,58 ppm** with an accuracy of **99.31%**. The difference in kailan plants growth using a control system tends to be faster when viewed from the number of leaves, stem width, leaf width and plant height than without using a control system.*

**Keywords : Fuzzy Logic, Hydroponic, Nutrient Film Technique (NFT), Nutrient, pH**