

CHAPTER 1

INTRODUCTION

1.1. Background

Hydroponics is a farming technique using water media that contains nutrients that plants need to grow and develop, therefore we must be careful in maintaining the nutrient content that is usually stored in a reservoir. This is the main problem if we cannot maintain optimal nutritional conditions in the reservoir, plants that lack nutrients will affect their growth, otherwise, plants with excess nutrients will quickly rot and turn yellow. Therefore, we need a tool that can control the levels of hydroponic nutrients in the reservoir.

We need a tool that can control the hydroponic nutrient reservoir based on a microcontroller in which fuzzy logic is embedded. Fuzzy logic itself consists of many rules that can regulate the output of the output pump which consists of a nutrition pump and a water pump, the output is in the form of a delay value which will be used to turn the relay on and off.

As we know hydroponic farming requires patience and accuracy in managing the nutrient reservoir, with this tool we no longer need to worry about nutrition for plants because everything is fully controlled by a microcontroller, for further it is hoped that this tool that already contains fuzzy logic can work continuously to control nutrient levels in the reservoir.

1.2. Problem Formulation

In this project, only a few issues will be explored.

1. Can this tool detect the TDS value and the water level in the nutrient reservoir?
2. Can fuzzy logic be implemented into a microcontroller?
3. Can fuzzy logic run continuously on a microcontroller?

1.3. Scope

This research uses :

1. Microcontroller Arduino uno
2. Using 2 sensor inputs:

(-) TDS sensor to detect PPM value.

(-) Ultrasonic sensor to detect water level.

3. Using output: LCD 16 x 2, two mini water pumps.
4. Using a fuzzy algorithm to process input data and map it to output.
5. Using AB MIX fertilizer.
6. The concentration of fertilizer is only used on leaf vegetable plants.

1.4. Objective

The objectives to be achieved from this project are as follows :

1. This tool can make it easier for us to control nutrients in hydroponic reservoirs optimally.
2. Fuzzy logic can run in tools that are built and can work continuously.
3. This tool can accurately detect nutrient concentrations and reservoir water levels.

