CHAPTER 1
INTRODUCTION

1.1.   Background

Lack of soil in urban areas results in our dependence on traditional markets and supermarkets to meet our daily needs. Moreover, those who live in densely populated areas like me really depend on traditional markets and supermarkets. Vegetables that are not difficult to cultivate are a problem for some of us. It's not that we don't know how to cultivating it but lack of soil is one of the main problems. Busyness is the next problem, many of us living in big cities have busy and sometimes erratic daily schedules. From school/college / work that we cannot ignore, so that the plants/vegetables that we cultivate are not taken care of, sometimes they wither and die.

To solve the problems I mentioned above in densely populated urban areas, my solution is to make a Mini Greenhouse equipped with the sensors needed by this mini greenhouse to automate the watering process such as soil moisture, temperature, and light sensors that will water the plants automatically and equipped with Fuzzy Logic algorithm. I will also implement Blynk a Smart Phone application to make it easier for users to monitor and provide reports on the development of plants that are planted anytime and anywhere.

The plant that I use in this project is Green Onions (Leeks). I chose leeks because leeks are one of the vegetables that are quite commonly used by Indonesians for cooking and are not difficult to cultivate in densely populated areas or at home, and also in some types of leeks do not require low temperatures for cultivation.

1.2. Problem Formulation

In this project, I will implement 3 sensors (FC-28, DHT11, BH1750) as input and the output that I use is a water pump that will pump water to irrigate the soil. For the soil moisture sensor I will use the FC-28, the moisture range that I will set as follows, 70 - 100% wet conditions, 25 - 80% humid conditions, and 0 - 35% dry conditions. For the temperature sensor, I will use DHT11, the temperature range that I will set as follows, 0 - 15°C cold conditions, 12 - 31°C normal conditions, and 30 - 40°C hot conditions. For the temperature sensor I will use BH1750, the light intensity range that I will set as follows, 0 – 300 x100 lux as dark conditions, 170 – 470 x100 lux as dim conditions, and 360 – 660 x100 lux as bright conditions.

1.3. Scope

Few problems will be discussed in this project:

1. Is this device can work in a controlled experiment environment with soil and plants (leeks)?
2. Does the Temperature and Light intensity affect how long the pump will irrigate?
3. Do different soil compositions affect the length of irrigation time?
4. Whats is the difference with previous research?

1.4. Objective

The purpose of this project is to develop a device that will be able to water the plants from which the data has been taken from moisture, temperature, and light sensor automatically using Fuzzy Logic algorithm and can provide notification to the user when the plants are watered.