CHAPTER I INTRODUCTION

A. Background

Water Spinach (*I. aquatica*), belonging to family Convolvulaceae, is widely cultured as an edible green leafy vegetable in Asia like Viet Nam, China, Malaysia, Thailand and Singapore (John, Lynn and Lee, 1987). It's well known for their essential biochemical and nutritional importance as they contained good amounts of proteins, fats, carbohydrates, vitamins and minerals as its leaf contain adequate quantities of amino acids, comparable to conventional food stuffs such as soybean or whole egg (Rao et al., 1990). It has been used as a traditional medicine for treating swelling, food poisoning, and antioxidant-related disorders in China (Flora, 2005) and India (Prasad et al., 2005), reduce the serum glucose concentration (Malalavidhane, Wickramasinghe and Jansz, 2000; Malalavidhane et al., 2003). Some resin glycosides are antibacterial (Barnes et al., 2003; León-Rivera et al., 2009; Pereda-Miranda, Kaatz and Gibbons, 2006; Reynolds et al., 1995), anti-inflammatory (Yoshikawa et al., 2010), antiviral (Ono et al., 2014), vasorelaxant (León-Rivera et al., 2011; León-Rivera et al., 2014). These research results demonstrate that water spinach may be regarded as a potential functional food and its economic value. So that, it needs a Water Spinach system to growth and yield of plant are better.

In modern agriculture at the moment, authors showed Hydroponic subsystems as Media Bed with the Hydroponic component generally using a sand, gravel, and aggregate culture bed (Lewis et al., 1978; McMurtry et al., 1993; Waten and Busch, 1984), and both Nutrient Film Technique (NFT) and Floating Raft had also been tested within the context of Aquaponic test, where plant nutrients were supplied from fish wastes while plants stripped nutrients from the waste water before it was returned to the fish (Rakocy, 1988, 2002; Rakocy et al., 2000; Rakocy et al., 1997; Rakocy, Shultz and Bailey, 2004). Hence, we saw that there are chooses of Hydroponic subsystem and for Maucieri et al. (2017) showed more than 120 publications on Aquaponic of the last 30 years and only 9% of them compared different types of Hydroponic subsystems and giving different result (Luis et al., 2019; Wilson and Brian, 2006).

And so, this research has been conducted to determine study the growth and productivity of *I. aquatica* (Kangkung Unggul Bika^{R} and Kangkung Bangkok LP-1^{R}) on two different Hydroponic subsystems (Pumice Bed and Floating Raft) in an Aquaponic test system breed fish *Pangasius hypophthalmus*.

B. Objective of the study

The main objective of this work is comparing growth and productivity of Water Spinach vegetables (Kangkung Unggul Bika^{R} and Kangkung Bangkok LP-1^{R}) in two different Hydroponic subsystems (Floating Raft and Pumice Bed) in an Aquaponic system.

C. Problem formulation

For modern agriculture, company is able to product many Water Spinach seeds to meet the tastes of consumers. Therefore, seeds are very diversity in the market. For this reason, this trial will assess two Water Spinach vegetables to growth and yield. Which seeds are the best while it is planted in an Aquaponic system.

At the moment, the scientists had researched lot of small-scale Aquaponic systems (SAS) production of vegetables and species fish in Aquaponic system. for diversity and abundant, this research has been performed to looking for one of two Hydroponic subsystems (Floating Raft and Pumice Bed) in Aquaponic system. It is the highest.

D. Benefits of the research

Water Spinach varieties and Hydroponic culture subsystems have been assessed in an Aquaponic (AP) test system.