AQUAPONIC – A MODERN FARMING SYSTEM

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ABSTRACT

This paper describes the potential of aquaponic as a poverty eradication tool in Malaysia. Although Malaysia is recognized as a developed country, poverty is still occurring among Malaysian, especially from rural area. Therefore, aquaponic – a modern farming system is being introduced to benefit the low income family. Aquaponic is the term that described the synergistic combination of aquaculture and hydroponic farming. Aquaponic system is comprised of two units, which is fish culture tank and plant growing area. This integrated system makes use of the rich nutrient wastes from cultured fish to cater the plant growth and in turn, the plant plays an important role to cleanse and re-oxygenate the water to be reused for the fish culture. A feasibility study to produce catfish and lettuce by aquaponic system has been carried out in involving 10 participants and the result has been found to be satisfying.

Keywords: aquaponic, modern farming system, lettuce, catfish, poverty eradication

INTRODUCTION

Aquaponic is a modern agriculture farming with the combination of aquaculture and hydroponic where the wastes from aquaculture activity will be utilised in the hydroponic system to produce plants, at the mean time, converting the toxic compounds in the water into non toxic before recirculating the water back into fish culture tank. Aquaponic is also know as a sustainable food production system which combine traditional aquaculture (fish in tank) with hydroponics (cultivating plants in water) in a symbiotic environment. Aquaponic system can be varying in the structure and size. The structure can be small indoor or outdoor while the size can be commercial use or private use. In fact, aquaponic has been practised for a long period. Chinampas technique used by the people at central Mexico in the past was regarded as the first form of aquaponics method. The plants were grown at the lake shallows and waste water was dredged from the chinampa canals to irrigate the plants. It is also a tradition to farmers in southern of China and Thailand to practice the polyculture system with the

combination of farming the paddy together with fish. Currently, modern farmers are even applying solar energy in operating the aquaponic system. In present paper, emphasize is given on aquaponic system being the tool to generate side income to the farmer.

PROJECT DESIGN

Ten participants were selected to involve in the aquaponic project. Each of the participants was assigned a unit of aquaponic system. The aquaponic system consists of a polystyrene fish tank of 3000 litres and a cement vegetation tank with the surface area 12' x 25'. The vegetation system was placed in the greenhouse whereas fish tank was located outside of the greenhouse. The capacity of fish and vegetable per system is estimated at 200 kg/year and 950.4 kg/year, respectively. The targeted fish species and vegetable are African catfish, *Clarias gariepinus*, and salad*, Lactuca sativa*.

ECONOMIC ANALYSIS

The cost to establish aquaponic project for 10 participants is shown in Table 1 whereas the margin that will generate is shown in the Table 2. Overall, the total cost to establish an aquaponic system for 10 participants is around RM 88,000 whereas the total income that will be generated through this project is estimated at RM 224.20/month/individual.

Table 1. The total cost of aquaponic system

Item	Budget (RM)
Fish tank & vegetable tank	**50,000**
Green house facility	**34,000**
Total asset cost	**84,000**
Operational cost	**4,000**
Total operational cost	**4,000**
Total cost (UMK)	**88,000**

Table 2. The income generated through aquaponic project

Item	Total (RM)
Income from vegetables	**28,512/year**
Income from fish	**6,400/year**
Project expense (operational cost)	**8,000/year**
Total income	**26,912/year**
Monthly income for 10 unit of aquaponic system	**2242 @ 224.20/participant**

CONCLUSION

Aquaponic is a modern agriculture farming system with combination of aquaculture and hydroponic, which can be carried out at almost any country. The output from aquaponic activity is promising as it can generate side income to the farmer.

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