

DESIGN A COMMERCIAL AQUAPONIC SYSTEM

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ABSTRACT

Aquaponic is a combination of aquaculture and hydroponics in recirculating systems. Nutrients generated by the fish, through microbial breakdown of organic wastes are absorbed by the plants cultured hydroponically. This is due to the fish providing most of the nutrients required for plant nutrition. As the aquaculture effluent flows through the hydroponic component of the recirculating system, fish waste metabolites are removed by nitrification, thereby filtered out by the plant as vital nutrients, which then the water is recirculated back to the fishes.

The Faculty of Engineering and Technology of INTI INTERNATIONAL UNIVERSITY has proposed a commercial-scale aquaponic system. The system consist of one fish rearing tank, one swirl filter, one hydroponic tanks and one filter tank. The overall major input are the fish feed, water supply (tanks), electricity and supplemental nutrients. The system can approximately produce 2222 tilapia along with 39995 lettuces or other variety crops.

The aquaponic systems can be applied outdoors under the condition of suitable weather or in environmentally controlled greenhouse. The system conserves and reuses the water, also recycles nutrients and requires very little land. The systems can be used on a subsistence level or commercial scale. Besides, production is continuous and sustainable as the system is simple, reliable and robust. This aquaponic system does not require a relatively high capital investment, moderate energy inputs but needs very high skilled management.