

Supangkorn Phanomrit 2011: Vertical Aquaponics System as Home Farming Unit and Shading device. Master of Architecture (Building Innovation), Major Field: Building Technology, Department of Technology Building. Thesis Advisor: Associate Professor Pasinee Sunakorn, M.Arch, 202 pages.

This research aims to study and design the Aquaponics system to plant vertically in order to use as home farming unit as well as shading device. The study investigates appropriate solution from fish as nutrients for growing vegetables. The system as Home Farming unit will occupy minimum space by planting vertically and can also be used as shading device installed at verandahs of condominiums, apartments and dormitories.

The study includes three experiments; first, to find a suitable configuration to put media in plant beds and water filtering system suitable for fish; second, finding suitable plants to grow in vertical DFT (Deep Flow Technique) beds of Aquaponic ; and third, design and install the system as shading device and comparing heat gain reduction of an aquaponic shading with an artificial wooden sunshade .

Results of the study find that this DFT aquaponic system can grow crops and raise fish well, with water property during experiment as follow, EC=1.3-2.0 mg/l, pH =6.8-7.1 mg/l, Nitrate =10-50 mg/l, Nitrite =0-0.15 mg/l and Ammonia=0-0.25 mg/l. The Vertical Aquaponic system as Shading Device which covered by amaranth green is best effective of heat Gain Reduction Transfer on Daytime and better than an artificial wooden (Fiber Cement) 0.78-2.5 °C in normal climate without Rain and strong wind. The plant beds can be adjustable according to the sun path to provide sunshade for a verandah. The aquaculture part has a re-circulating system This Vertical Aquaponics system was designed and installed on the real building to investigate food production as well as thermal performance.

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Thesis Advisor's signature