

Project Title

Promoting Urban fish farming of catfish in aquaponics recirculated aquaculture system

Project Background

Catfish is one of the two common fish species being farmed in Uganda due to its fast growth rate, disease resistance, aerial respiration, high feed conversion efficiency, acceptability of a variety of food items, resistance to handling stress, high stocking density and good local and regional market. It also has got great potential of addressing nutritional security and household incomes. Despite of the above advantages, the production of catfish is still very low in the country predominantly due to high level of cannibalism in all the production technologies including the hatcheries and this vice is real due to inadequate knowledge on sorting and right stocking size. Coupled with this, the main production systems used by farmers is earthen pond system which does not favor sorting but requires right stocking size with very minimal cannibalism. -With increasing population and urbanization, there is need to adapt the production technologies that favors proper management of cannibalism in catfish for higher production potentials and profits like aquaponics. Besides, aquaponics being favorable for sorting, the technology requires limited land and less water usage making it a potential fish farming system in urban areas. The technology is also environmentally friendly since it allows nutrient recovery and reuse thus producing less waste to the environment.

Several studies have been done on the growth performance of catfish in earthen ponds however less has been done on the effects of sorting frequencies on cannibalism in concrete tanks, the right stocking size of this fish and leafy vegetable performance in Aquaponics. Hence the aim of this study is to determine effects of sorting frequency on cannibalism and growth performance in catfish (*Clarias gariepinus*) and leafy vegetables in a low-tech solar supported aquaponic system.

Objectives

- i. To assess the growth rates of *Clarias gariepinus* and leafy vegetable in Aquaponics in an indoor solar energy supported system.
- ii. To determine the survival rates of catfish fingerlings in the indoor solar energy supported system
- iii. To determine the optimum sorting frequency of catfish culture in Aquaponics

Progress

Three (3) experiments each for a period of 4 months are to be set. So far 1 experiment has been concluded and another one is on-going. The fish that are used for sorting experiment are letter



Photo 1: Pictures of the rearing tanks and the spinach vegetables in the grow bed of an aquaponic system.

Survival rates

The survival rates ranged from 84 to 75% however, concrete tanks showed significantly ($p < 0.05$) less survival rates than glass tanks

Treatment	Glass tanks	Concrete tanks
Treatment A	587 (98%)	501 (84%)
Treatment B	582 (97%)	510 (85%)

Growth rates

In 6 months, the average weight gain of catfish was (700 ± 120) g, (590 ± 780) g and (457 ± 52) g in out door plastic tanks, in-door glass tanks and in-door concrete tanks respectively.

Lessons learnt

Considering the indoor systems, Catfish in glass tanks showed higher survival rates and growth rates than that in concrete tanks. The concrete tanks showed higher bacterial infections than the glass tanks. However, catfish in outdoor plastic tanks showed the fastest growth rates than those in doors. Though, these out door plastic tanks requires constant cleaning since they are constantly infected by algal blooms.