PRACTICE ABSTRACT nº 24

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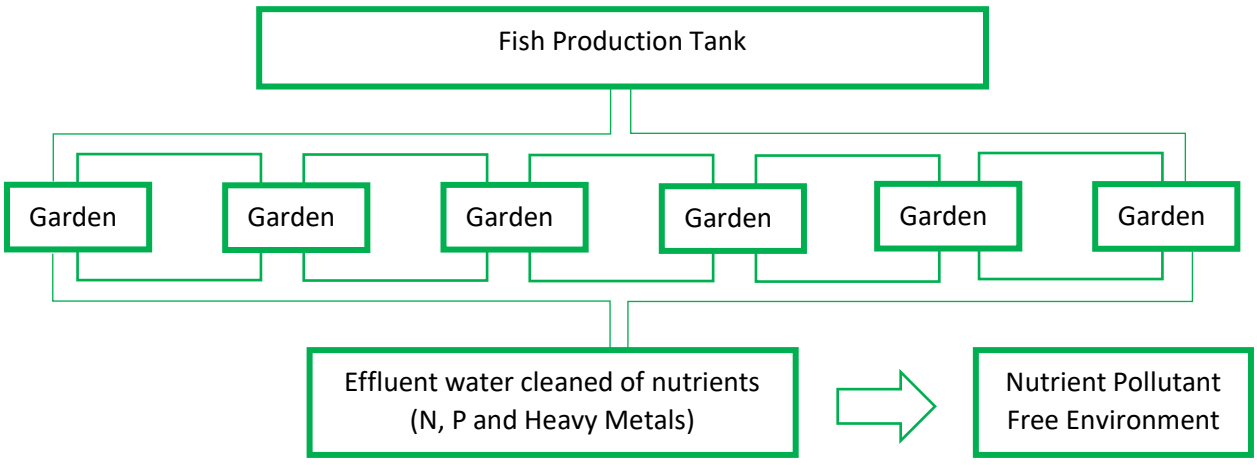
Integrated Aqua-agriculture: Use of wastewater from fish production to promote vegetable growth

Aquaculture has been identified as one of the most plausible options to bridge the gap between the growing fish demand and the declining fish production from capture fisheries; however, if not managed correctly, it can be an environmental threat. Several technologies have been developed targeting intensification with little attention being paid to the effects of aquaculture effluents on the aquatic environment. Increasing aquaculture intensification, if not well managed, can lead to increased release of fecal waste and uneaten feeds which, when broken down, can result in the release of excess nitrogen and phosphorous into local waterways. These can potentially accumulate to levels that can trigger eutrophication in aquatic systems and in extreme cases lead to fish deaths. The production of vegetables using aquaculture waste=water does not only play a critical role in nutrient recycling thereby reducing the P and N discharge into the environment but also has the potential to improve food and nutritional security and increase household income.

Leaf vegetables irrigated with aquaculture effluents

This study was aimed of demonstrating to smallholder farmers the best, cost-effective integrated fish-vegetable models for cleaner production, sustainable agriculture and increased household food security and incomes. Fiberglass tanks (1.0m3) have been used to simulate fish production facilities with vegetables grown in earthen gardens adjacent to these tanks stocked with African catfish (*Clarias gariepinus*) of average weight 10gms at 5kgs per of fish m3. The findings from this study will be used determine; 1) The nutrient (phosphorous and nitrogen) extraction efficiency of the different vegetables used in the fish-vegetable integrated production model; 2) Compare the growth performance of African catfish (*Clarias gariepinus*) farmed in fish-vegetable integrated model in relation to the commercially cultured African catfish; 3) Compare the crop production yield from fish-vegetable integrated model with production from specialized vegetable gardens; 4) Evaluate the quality of the produce (fish and crops) in terms of nutrients and bio accumulation (heavy metal); 5) Assess the economic viability (cost-benefit analysis) of the two suggested integrations.



Schematic flow of waste water used to irrigate the vegetables

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