

## **Effect of biofertilizers on the integrated culture of genetically improved farmed tilapia and green beans in aquaponics**

### **ABSTRACT**

This study was designed to determine the effect of commercial biofertilizers, namely chitosan, *Bacillus* spp. and Effective Microorganism formulation on the production efficiency of Genetically Improved Farmed Tilapia (*Oreochromis niloticus*) and green bean (*Phaseolus vulgaris*) in an aquaponic system. The intended purpose was to examine if the production of the two integrated species can be optimized by cost-effective methods consistent with the concept of circular economy. While the biofertilizers performed water quality remediation as seen from the dynamics of turnover of ammonia ( $\text{NH}_3$ ), nitrite ( $\text{NH}_2$ ), nitrate ( $\text{NO}_3$ ) and phosphate ( $\text{PO}_4$ ) but produced no significant impact on growth of the fish, and the green bean could not attain the fruiting stage. Green beans that generally produce white-purplish flowers which transform into pods dropped off after one week on the plant. The water quality parameters: dissolved oxygen (5.54 to 6.12 mg/L), pH (6.9 to 7.0) and water temperature 26.7 to 27.8°C were in the suitable range but evidently the green bean faced deficiency of nutrients that are needed for fruiting. The nutritional management requires further investigations since the green bean pods are a rich source of human food, and maximum benefits from aquaponics can be derived through their production and faster growth of the fish. The trend of fish growth suggests that the biofertilizers will result in significant growth advantage if the treatment is carried out over a longer farming period.