B-26: Effluent quality of shrimp farming systems in the North Western Province

A S L E Corea[1], S U K Ekaratne[2], J M P K Jayasinghe[1]
([1]*National Aquatic Resources Agency, Colombo 15,* [2]*Dept of Zoology, Univ of Colombo, Colombo 3*)

Effluent quality is one of the most important parameters to be considered in design, management and siting of sustainable shrimp farming systems.

The results of an investigation on efffluent quality of 2 different shrimp farming systems in the North Western Province of Sri Lanka, are described.

The two farming systems observed were, high stocking density (> 10 post larvae/m^2) with aeration and low stocking density (< 10 post larvae/m^2) without aeration. Farming systems with high stocking density discharge 2 - 3 times the volume of water when compared to systems with low stocking density.

The nitrate concentrations (0.038 - 0.025 mg/l), Phosphate concentrations (0.223 - 0.091 mg/l), Nitrite concentrations (0.068 - 0.029 mg/l), Sulphide concentrations (2.80 - 1.25 mg/l) and Ammonia concentrations (0.074 - 0.011 mg/l) in the effluents of both farming systems did not show significant difference over a culture cycle. Suspended solids levels (396.622 - 29.079 mg/l) were very high in both farming systems. pH was alkaline (8.673 - 0.609) in the effluents of both systems.

Results of all parameters were analysed using the t test to compare the means of the parameters in the 2 different farming systems.

Considering the difference in water exchange rates, the quantity of water discharged from high stocking density farming systems was higher than the lower stocking density system over a culture cycle.

Nutrients, suspended solids and metabolic toxicant loadings in the environment from the systems with high stocking density with aeration was high compared to the other system with low stocking density, over one culture cycle.

As the effluents are discharged into the same water body, the water source is getting polluted with respect to some of the parameters studied. This indicates that some farms would be receiving water of sub-optimal quality for culture purpose. Cultured Shrimps could be brought under stress conditions due to the water quality and this could result in spreadng of disease.

Therefore, effluent should be treated before releasing to the environment. Oxidation and sediment settlement tanks are strongly recommended.