B-64: Problems in semi-intensive shrimp culture in acid sulphate soil: a case study

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Rapidly expanding shrimp culture industry is increasingly constrained by problems related to water and soil quality. There are about 300 ha of shrimp farms located on acid sulphate soil around the coastal areas of Chilaw lagoon. Frequent disease outbreaks from such environments result in reduction in production and the quality of the harvest inflicting heavy economic losses. The present study reports the results of a close monitoring programme in a selected shrimp farm located in the Western margin of the Chilaw lagoon on an acid sulphate soil.

Close monitoring of microbiological parameters in cultured shrimp, pond water and bottom sediment was carried out together with critical water quality and sediment quality parameters over a period of 6 months. All management procedures and regular monitoring of growth, production and appearance of disease symptoms were also investigated.

The average production in the ponds varied 0.75-0.95 mt/ha/crop which is below 50% of average production (2.1 mt/ha/crop).

Relatively high quantities of lime and dolomite were used at the pond preparation (4 mt/ha/crop) as well as during the culture operation.

Except for the hydrogen sulphide concentration, other monitored water quality parameters were within the acceptable range. Soil samples remained basic due to heavy liming.

Rolling of the carapace on the cephalathorax covering the gills, black spots and tail rot were the most commonly observed symptoms during disease outbreaks. Reddish brown deposits of hydrated oxides of iron were found on thoracic and abdominal appendages. The first appearance of symptoms was observed after 6 weeks of culture, which spread to a fairly acute level in 11-12 weeks leading to remarkable reduction in feed consumption. Although the farms in NWP allow a normal growth period of 16-20 weeks, the pond under study had to be harvested in 12 weeks to avoid mass mortalities.

Results of the microbiological analysis revealed that total bacterial counts (TBC) ranged, 10^4 - 10^6 /g shrimp, 10^2 - 10^3 /ml for pond water and 10^2 - 10^5 /g in bottom sediment. *Vibrios* were the most predominant bacteria in these samples contributing to over 90% of the quantitative flora. The main isolate from the areas of black spot of shrimp was a sucrose negative *Vibrio*.