**PREFACE**

FAO defines aquaculture as “the farming of aquatic organisms, including fish, mollusks, crustaceans, and aquatic plants”. Farming here implies some form of intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators. Aquaculture is the only alternative to mitigate the threats to the world’s fisheries by taking the pressure off from wild fish stocks while supporting livelihoods and food production. Aquaculture production has increased tremendously over the past few decades and today accounts for almost a half of global fish production by weight, while production from wild fisheries has largely slowed or stagnated.

With the advent of ‘Factory Farming’ concept, farmers have shifted from traditional to more intensive aqua-farming practices. The intensification of culture practices requires careful feed management and monitoring of water and soil quality, particularly in shrimp culture ponds. Oxygen is one of the most critical water quality parameter that limits the production. Further, cultured shrimp species also depend on benthic in-faunal invertebrates such as macro- meio- and micro benthos, and phytoplankton in the water, particularly during the early stages of their growth. They require oxygen for respiration along with cultured species. Dissolved oxygen is also required for oxidation of organic matter of uneaten feed and feces. Sustained reduction of dissolved oxygen in such cases can lead to hypoxic to anoxic conditions, which is harmful not only to cultured species but also to the benthos which form important food source for the cultured species.

In anoxic environments, denitrifying bacteria leads to formation of ammonia and hydrogen sulphide (H₂S) formation takes place through bacterial degradation of accumulated organic matter. These toxicants are known to cause mortality of cultured shrimps. To avoid anoxic environment and formation of such toxicants causing mortality and to achieve optimum production, various types of aeration devices are therefore used in aquaculture. Aeration devices improve the oxygen in the water and help ultimately in maintaining the natural equilibrium of nitrogen, carbon, sulfur and phosphorus cycles in the aquaculture systems. Thus it ultimately
keeps the culture environment healthy by artificially or mechanically mixing atmospheric DO in the water. With the advent of new aeration system developed by HOBAS Norway, its performance, in maintaining dissolved oxygen and subsequently the nutrient variations and possibilities of their effect on the benthos development in shrimp culture ponds was thus monitored. The present study in this view, is an account of the research carried out, describing the changes occurring in water quality and ecobiological parameters over two shrimp culture cycles, in aerated and non-aerated shrimp ponds, over two years in a commercial shrimp farm located in South Western coastal India.