

Designing a Wastewater Treatment Plant for the Wastewater Discharge from Seafood Market

S. Suthassna*, D.J. Kottehewa and T. Udagedara

Applied Earth Science, Uva Wellassa University, Badulla, Sri Lanka

Seafood is the main interest in the coastal areas; hence seafood markets are centralized towards the city and highly crowded place. A seafood market includes many varieties of fishes, crabs, clams, prawns, lobsters, cuttlefish, etc. from saltwater as well as from freshwater. In general, wastewater generation from the seafood market is not given much attention and thus, lack of awareness about the problematic factors associated with that. The wastewater from this mainly contains blood, shells, fines, fish heads, offal products, and detergents used for cleaning and washing. In this study, the wastewater generated from the seafood market in Trincomalee was investigated. The wastewater characterization was done for 5 months. The results of the wastewater characterization showed that the average value of pH, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) were 7.62, 195.2 mg L⁻¹, 870.20 mg L⁻¹, and 88.20 mg L⁻¹, respectively which are exceeding the tolerance limit set by Central Environmental Authority of Sri Lanka. The oil and grease, nitrate, and phosphate are within the tolerance limit set by the Central Environmental Authority of Sri Lanka. The BOD: COD ratio was 0.1, which implies that the wastewater is less biodegradable, and biological treatment is not suitable in this case. The design of the wastewater treatment plant was proposed with chemical coagulation as a pre-treatment. Bar rack was placed as a preliminary treatment, then equalization tank was designed to control the flow variation, next the coagulation tank was followed by a clariflocculator. Finally, the design of the wetland with aerated Hyacinth system with recycle was proposed. Additionally, COD removal efficiency was checked with bio sorbents prepared using Water Hyacinth and Rice husk.

Keywords: Sea food market wastewater, Wastewater characterization, Designing wastewater treatment plant