

## ABSTRACT

This research had a purpose of explaining effectiveness of High Rate Oxidation Pond (HROP) for algae growth and wastewater pollution control. Light intensity, pond dimension (depth) and water velocity support activities in the pond, promoting symbiotic relationship between algae and bacteria. HROP pond operational is based on Oswald pattern about light intensity, BOD value, pond depth and detention time.

Wastewater from slaughterhouse industry was sorted for processing using integrated system management with fish cultivation. That wastewater contain very high organic material, so for avoiding shocked load of wastewater, it was needed for reducing the load using Anaerobic Baffled Reactor (ABR).

The result of research shows that ABR had a COD reduction efficiency of 60%, BOD 67%,  $\text{NH}_3\text{-N}$  54% and coliform bacteria 31%. The best reduction efficiency of the waste content was pond with 70 cm depth, at 20 cm/sec velocity, i.e. COD 85%, BOD 84%,  $\text{NH}_3\text{-N}$  84% and coliform bacteria 33% and able to produce chlorophyll-a 9.76 mg/l. Light intensity affects algae growth, subsequently affect waste reduction efficiency. Correction factor BOD for Oswald pattern producing a constant of 8,5758 mg/l. HROP pond effluent could be used as energy source for *Oreochromis nilotica* fish growth.

For reducing ammonia content at fish pond, it was suggested to use propeller. It was needed to cultivate other kind of algae at HROP for understanding the relationship between waste reduction and the advantage of algae as food resource for fish.

**Keyword:** Anaerobic Baffled Reactor (ABR), High Rate Oxidation Pond (HROP), Fish Cultivation, Light Intensity, Pond Dimension and Water Velocity.

