Cost Optimization in Wastewater Treatment by Aquaculture

Ashtashil V. Bhambulkar¹, Dr. Narendra P. Shinkar²

¹ Research Scholar, Civil Engineering Department,
Sant Gadge Baba University of Amravati, Amravati.
² Department of Civil Engineering,
Government Polytechnic Nagpur, Nagpur (India)

ABSTRACT
The overall aquatic environment is degrading both qualitatively and quantitatively owing to rapid urbanization, industrialization and growing population. Billions of liters of water converted into wastewater due to everyday from various sources such as domestic sewage, industrial wastes, and agricultural discharges containing detergents, toxic metals, thermal pollutants and radioactive materials in water. With the current scenario on environmental health and water pollution issues, there is an increasing awareness of the need to dispose of these wastewaters safely. In the absence of suitable technology and facilities for treatment, they are inevitably discharged into fresh and &waters.

Keyword- Waste stabilization pond, Cost economics, algae pond, duckweed pond.

I. INTRODUCTION
An energy and construction costs have increased, new methods of wastewater treatment with potentially lower energy and capital costs have become increasingly attractive. Relatively simple wastewater technologies can be designed to provide low cost sanitation and environmental protection while providing additional benefits from the reuse of water. Effluents from conventional treatment facility not only contain some unstable organic matter but also nutrients, which represent potential energy. It is therefore illogical to utilize external energy sources to dissipate energy stored within the wastewater. A natural treatment system makes use of aquatic animals and plants to improve the water quality and reclaim nutrients. In addition, persistent toxic environmental contaminants such as pesticides, aromatic hydrocarbons and metal scan be removed from wastewater through biological treatment process. Natural wastewater treatment systems include algal mass culture, macrophyte treatment systems (including constructed wetlands) and aquaculture. Natural systems may be utilized to treat agricultural, domestic and industrial wastewater. Climate, soil conditions, space, waste characteristics and other factors relate to its applicability.
II. MATERIAL AND METHODOLOGY

Stabilization ponds are an important part of the natural treatment ways. The desired treatment effect is achieved by physical, chemical and biological processes, taking place in the aquatic environment with the participation of aquatic and wetland biocenosis (bacteria, phytoplankton, and zooplankton), higher vegetation and organisms. Their task is to regulate and stabilize the physical, chemical and biological properties of treated wastewater. They are divided into low- and high loaded ponds. Waste stabilization ponds are three types first is aerobic type pond, second is anaerobic type pond and third is facultative type pond. Model of wastewater treatment. The model of the proposed sewage treatment aquaculture farm is shown in Figure-1.

![Model of Wastewater Treatment](image)

**Fig 1. Layout of Pond Model**

III. CONCLUSION

Economic analysis of the proposed model of sewage treatment aquaculture farm and the proposed cultural practices, shows that there will be an annual profit of Rs. 7084/- on an annual investment of Rs 392916/-. The farm would produce nutrient waste water for farming purpose or any other industry purpose and would generate employment of 1095 men-days per year.

REFERENCES


