

ABSTRACT

Shrimp is one of the fishery commodities in Indonesia with high economic value. In shrimp farming, proper water quality management is essential to achieve optimal harvest results. Ammonia and water turbidity in shrimp farming are two crucial parameters that can significantly affect the growth and survival of shrimp. This research aims to design and develop a water circulation system that effectively controls ammonia levels and water turbidity in shrimp farming. The water circulation system is designed by considering several factors, such as the type of shrimp cultivated, pond size, and available water sources. In this study, three types of sensors are used: a Turbidity sensor to measure water turbidity, an MQ-137 sensor to measure ammonia levels, and a Water Level sensor to measure water levels in the pond and water storage tank, all connected to an ESP-32 microcontroller. The optimal water quality for vannamei shrimp farming is a low ammonia level (≤ 0.1 mg/L) and water turbidity ranging between 25–400 NTU. When ammonia levels and turbidity exceed the water quality standards, the water circulation system will activate to restore the water quality to optimal conditions. The water circulation system designed and developed in this research can help improve and maintain water quality in shrimp farming, support shrimp growth and survival, and increase harvest yields and profitability from shrimp farming.

Keywords: *Shrimp Farming, Ammonia, Water Turbidity, Shrimp Growth, Harvest Yield.*