ALEF ABSTRACT

Catfish farming in Indonesia is a promising fisheries sector with production growth of 1,139.15 million tons with a total value of IDR 20.93 trillion. However, conventional technology makes it difficult for novice catfish farmers such as land ponds with an average size of 100-500 m². In addition, the care of 2-3 cm catfish seedlings requires intensive monitoring of water parameters, feeding, and a 30-40% mortality risk in the early phase. To overcome this, this research developed the **Automatic Catfish Farm (ALEF)**, an IoT-based hydroponic integrated catfish farm barrel designed to facilitate small-scale cultivation. The ALEF is equipped with pH, temperature, and water turbidity sensor modules connected to an ESP32 to monitor real-time conditions through a smartphone. The system also features schedule-based automatic feeding, notification of disturbances such as water that is too acidic or turbid, and a camera for visualization of fish conditions. ALEF is also equipped with a Whatsapp bot that can help monitor the condition of ALEF on command or answer questions about ALEF. Our trials conducted with 50 local catfish seedlings with a length of 8 cm showed that its main advantages lie in the efficiency of 50 m² of land, the response of tools that can monitor in real time with a minimum average error, stable kale growth for additional income and ease of operation for beginners. With such results, it can be ascertained that ALEF has the potential to be a solution for new catfish farmers, attract people to catfish farming, and make ALEF an option to simplify catfish seed treatment.

Keywords: IoT, catfish farming, hydroponics, land efficiency, automation, beginner farmers, additional income.

Source: Central Bureau of Statistics (BPS) 2022