DEVELOPMENT AND IMPLEMENTATION OF A SUSTAINABLE FISH CULTURE SYSTEM IN CIRCULAR TANKS IN THE BRAGANTINA REGION

Lucas José Araújo de Oliveira (IFPA), Emanuel Ramos da Costa (PPNBC/UFPA); Anderson de Jesus Falcão da Silva (PPBCM/IFPA); Jhon Carlos do Nascimento Costa (PPBCM/IFPA),Nara Gyzely de Morais Magalhães (PPBCM/IFPA) Cristovam Guerreiro Diniz (PPBCM/IFPA)

jose261996.lj@gmail.com

THEMATIC AREA AND ODS

FIELD OF KNOWLEDGE :09 Multidisciplinary
RELATED ODS: ODS02 e ODS12

INTRODUCTION

Aquaculture arises from the population's demand for food due to demographic growth. This practice involves the cultivation of aquatic organisms under controlled conditions. However, in addition to generating substantial volumes of effluents, its operation relies on the use of water (Silva et al., 2013; Ferri et al., 2018).

Considering that water is a limited resource, it is crucial to implement cultivation techniques that promote the sustainable use of water resources to maintain environmental quality. In this context, aiming for the sustainable economic development of the Bragantina region, our efforts consist of establishing a sustainable fish cultivation system in circular tanks.

MATERIAL AND METHODS

General Characteristics of Circular Tanks

In general, the circular tank (CT) has a semi-conical shape (see Figure 1A, B, and C), in which structures are subsequently designed to assist in leveling mechanisms, water drainage, recirculation, and waste filtration (Timmons et al., 1998).

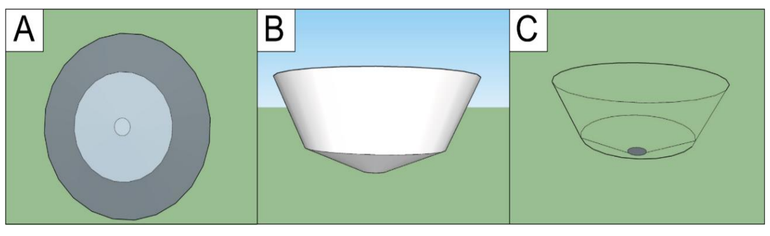

Figure 1 - 3D model of the circular tank in the top view (A) and the side view (B), along with the transparent illustration (C).

The coating process involved the application of three layers: plastic tarpaulin, galvanized mesh of 2 inches, and cement.

Figure 2 - Excavated circular tank covered with plastic tarpaulin and galvanized mesh (A), followed by the coating with cement (B).

The airlift, connected to a pipe that runs from the center to the outer part of the tank, is installed vertically in the external compartment of the tank, which in turn is connected to the biological filter.

Figure 3 - Airlift Pump

RESULTS AND DISCUSSION

Locations of TC Implementation with Water Recirculation System

Location 1: Research and Application Center in the Brazilian Amazon - CPAM of the Federal Institute of Science and Technology of Pará (IFPA) - Bragança Campus.

The circular tank at CPAM has a diameter of 7 meters, with a depth of 1.60 meters in the center and 1.40 meters at the edges.

Figure 4 - Circular tank with constructed water recirculation system (A), along with the airlift (B) and the installed biological filter (C).

Location 2: Sítio Maria Paula 1, Monte Negro, rural area of Bragança-PA (S1° 07.328' W46° 49.764') (under construction). The measurements for width, center length, and edge depth are as follows: 40m, 1.80m, and 1.5m, respectively.

Figure 5 - Construction of the circular tank at Sítio Maria Paula 1.

Water Economy

The circular tank (CT) does not require a continuous addition of water during the production cycle, allowing for reuse one or more times. The water is not discharged directly into the environment, ensuring greater control and security against the risk of introducing invasive species into natural ecosystems.

Increased Growth Through Exercise

Pereira et al. (2020) analyzed the effect of physical exercise on the development of tambaqui (*Colossoma macropomum*) and found a direct relationship with a significant increase in weight and length when compared to individuals with a sedentary lifestyle.

CONCLUSION

The implementation of the recirculating aquaculture system (RAS) is a viable production alternative, both economically and environmentally, as it can ensure high productivity and sustainability throughout the entire process. Additionally, this system promotes water savings through the reuse of this resource across multiple production cycles and facilitates weight gain by inducing voluntary physical exercise.

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