World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:16, No:01, 2022

Modified Mangrove Pens for Polyculture System in Mud Crab (Scylla serrata) and Milkfish (Chanos chanos) Production

Authors : Laurence G. Almoguera, Vitaliana U. Malamug, Armando N. Espino, Marvin M. Cinense

Abstract : The mangrove pens were modified to produce mud crab (Scylla serrata) and milkfish (Chanos chanos) in a polyculture system. The modification of mangrove pens was done by adding excavations inside the pen. The water quality parameters (dissolved oxygen, pH, salinity, and temperature) were monitored, the recovery and the production rate in each pen were evaluated. The experiment was conducted for a rearing period of 143 days in nine mangrove pens, each having an area of 32 m^2 with an average net enclosure height of 3 m from the soil surface. The three different pens constructed (existing design - with canal only, with 43% excavation by area, and 54% excavation by area) were designated as T_1, T_2, and T_3, respectively. All experimental units were stocked with 31 pieces of crablets (with 33.3 g average weight) and additional 130 pieces of milkfish fingerlings (with 0.11 g average weight) to the modified mangrove pens. The water quality parameters recorded in the pens were favorable for the growth and recovery of the mud crab and milkfish, except for dissolved oxygen (DO). It was found to be the reason for the total mortality of the stocked milkfish. For mud crab, the highest mean recovery was recorded in T_2 (34.41%), followed by T_3 (26.91%) and the lowest in T1 (21.50%). The production rate followed the same trend as the recovery, where T_2 (74.49 g/m^2) obtained the highest, followed by T_3 (55 g/m2) and the lowest was in T_1 (34.87 g/m^2). The statistical analysis revealed that the variations of the mud crab recovery were not significant, while in terms of production rate, modified mangrove pens were found to be more effective than the existing design. Due to the total mortality of the cultured milkfish, the current set-up of modified mangrove pens was found to be not suitable for the polyculture system of milkfish and mud crab production.

Keywords : aquasilviculture, milkfish, modified mangrove pen, mud crab, polyculture, production rate
Conference Title : ICABBBE 2022 : International Conference on Agricultural, Biotechnology, Biological and Biosystems Engineering
Conference Location : Rome, Italy
Conference Dates : January 14-15, 2022