ASSESSMENT OF WATER QUALITY, PHYTOPLANKTON COMMUNITY AND GOVERNANCE AS INTEGRATED FACTORS TOWARDS SUSTAINABLE AQUACULTURE IN TAAL LAKE BATANGAS, PHILIPPINES

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ABSTRACT

Taal Lake has been the economic source through aquaculture, specifically of fish cages in the surrounding municipalities. The study assessed how aquaculture activities affect the water quality by comparing the physico-chemical characteristics and phytoplankton communities between the aquaculture and non-aquaculture sites. Using Estimates S and Canonical Correspondence Analysis (CCA), the correlation between physico-chemical characteristics and phytoplankton density as well as phytoplankton species diversity was also established. Aquaculture practices and policies were also assessed through interviews of key informants. Transparency, water temperature, salinity, pH and dissolved oxygen were not significantly different between the two study sites during the 10-month sampling period. On the other hand, there were significant differences in terms of the levels of nitrates, phosphates and total dissolved solids (TDS). A total of 39 genera of phytoplankton, under Chlorophyta, Cyanophyta, Chrysophyta and Pyrrophyta, was observed in Taal Lake. The phytoplankton, *Microcystis* under division Cyanophyta was the most dominant species indicating eutrophic condition of the lake. The phytoplankton density was significantly higher in aquaculture than non-aquaculture sites. However, species diversity was higher in non-aquaculture sites than aquaculture sites indicating stability of ecosystem. Water temperature, nitrates and TDS were positively correlated with phytoplankton abundance. Based on the DENR standards, only phosphates and TDS exceeded the maximum limit for Class C standards which is suitable for aquaculture. The practices governing stocking density and feeding frequency on aquaculture were not strictly observed by the fish cage operators. Continuous vigilance, cooperation and participation of all stakeholders in the lake are needed to manage the lake and make fish production sustainable.

Key words: phytoplankton, aquaculture, Taal Lake, water quality, sustainability, governance

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