ABSTRACT

There are phenomena gap of aquaculturist behavior, and research gap of aquaculture bioeconomic, so, I am interested to research a bioeconomic modelling in aquaculture. The purpose of this study were (a) to develop bioeconomic model to estimate a profit, estimate a time of aquaculture to produce an optimal profit, and estimate a time of aquaculture to produce a certain average weight of fish as market target, (b) to apply the bioeconomic model in this research to Red Tilapia culture use floating cages in Wadaslintang Reservoir (in case: cooperative 'Serba Usaha Bersama Maju Sejahtera'), and (c) to estimate the length-weigth relationship and weight infinity of Red Tilapia. This research used the model of von Bertalanffy length growth, length-weight relationship and mortality rate to estimate a fish biomass progress. The harvested fish biomass and fish price were determined to be factors that affect the revenue from aquaculture. The components of total cost were the costs of seed procurement, feed, transportation of the harvest, and daily expenditure. The daily costs of aquaculture in floating cages included those associate with labor, medicines, energy, asset depreciation, equipment, and maintenance of assets, and were converted to IDR/day. Maximum profit was estimated from the derivative of the equation of profit versus aquaculture time (first order condition), where the second derivative is negative (second order condition). Applying this model to the culture of red tilapia culture in Wadaslintang Reservoir, I estimated that the optimal aquaculture time that generates maximum profit is 286 days (*lower bound*: *284 days; upper bound: 290 days*) *with the profit was IDR 34,095,810* (*IDR. 32,931,547 – 35,075,394) per cycle of culture and the average weight of fish cultured was 622g (610-637g). The relationship of length-weight was* $W=0.016.L^{3.005}$. *An estimation of infinity weight and infinity length were 2.09 kg and 50.04 cm.*

Keywords: *bioeconomy, profit maximization, Model of von Bertalanffy, Red Tilapia culture.*