THE INFLUENCE OF SEAWEED GROWTH IN FLOATING RAFT CULTIVATION METHOD IN WAVE REDUCTING

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ABSTRACT

This thesis has objectives to understand the influence of the wave steepness, planting density and seaweed relative length to wave transmission coefficient $K_t$. The floating variables are used: an incoming wave height ($H_i$), wave period ($T$), distance of planting density ($k$) and the length of seaweed ($s$). Parameters are slope wave steepness $Hi/gT^2$, density planting distance and relative $k/gT^2$ long grass relative $s/d$. Therefore, nondimensional parameters. The scale model 1:10 and the water depth 0.4 m.

The research shows that the transmission coefficient is inversing with wave steepness, relative planting distance density and the relative length of seaweed. Transmission of waves increases with decreasing the wave steepness, the relative of distance planting density and the relative length of seaweed. The smallest transmission coefficients $K_t$ found on when seaweed ready to harvest ($s/d$) = 0.25 with the size of the planting density distance ($k$) = 0.0025 m is in the range of 0.61 - 0.80 and for the wave steepness $Hi/gT^2$ = 0.0140 - 0.0992, and relative density planting distance ($k/gT^2$) = 0.0008 - 0.0022. The biggest transmission coefficients $K_t$, found when the length of seaweed on seed size ($s/d$) = 0.0375 with the planting density distance ($k$) = 0.05 m, which ranges between 0.82 - 0.98. This is found far wave steepness $Hi/gT^2$ = 0.0046 - 0.0834, and relative distance of the planting density ($k/gT^2$) = 0.0014 - 0.0053.

The formulation of non linear transmission coefficients suggested to estimate the growth on the seaweed cultivation floating raft method is:

$$K_t = \frac{1}{1 + 1.8610^2 \left( \frac{Hi}{gT^2} \right)^{0.156} \left( \frac{k}{gT^2} \right)^{0.0122} \left( \frac{s}{d} \right)^{0.526}}$$

The results of this research are expected to be developed as an alternative structure for protecting the coastal environment-friendly and economical value.

Keywords: Growth, Density Distance Planting, Seaweed, Wave Transmission.