

Potensi sekuestrasi karbon pada makroalga *Kappaphycus striatum* di kawasan budidaya rumput laut, Desa Alaang, Pulau Alor, Nusa Tenggara Timur = Carbon sequestration potential on macroalgae *Kappaphycus striatum* in seaweed aquaculture site, Alaang Village, Alor Island, East Nusa Tenggara

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Abstrak

Sekuestrasi karbon pada makroalga melalui fotosintesis dapat berkontribusi terhadap permasalahan perubahan iklim. Penelitian ini bertujuan untuk menganalisis potensi sekuestrasi karbon pada makroalga *Kappaphycus striatum* dengan umur pemeliharaan yang berbeda; usia bibit (25 hari) dan usia panen (60 hari). Sampel diambil secara acak pada sistem budidaya lepas dasar, di Desa Alaang, Pulau Alor, Nusa Tenggara Timur. Parameter yang diamati ialah kadar karbon melalui analisis gravimetri. Pengukuran laju pertumbuhan dan eksperimen botol gelap-terang juga dilakukan untuk dianalisis lebih lanjut. Hasil penelitian menunjukkan bahwa potensi sekuestrasi karbon pada lahan budidaya rumput laut seluas 1,552 m² ialah sebesar 13.28 ton C/siklus tanam untuk makroalga usia bibit dan 26.23 ton C/siklus tanam untuk makroalga usia panen. Nilai ini secara berturut-turut setara dengan 66.07 ton C/ha/siklus tanam dan 125.51 ton C/ha/siklus tanam. Berdasarkan hal ini, potensi sekuestrasi karbon pada makroalga usia panen 32.78 % lebih besar daripada makroalga usia bibit. Hasil juga menunjukkan bahwa potensi sekuestrasi karbon dapat dipengaruhi oleh laju pertumbuhan dan produktivitas primer. Selanjutnya, manajemen kawasan budidaya rumput laut dengan mengintegrasikan nilai ekologi dan nilai ekonomi, dapat berpotensi untuk menyediakan berbagai manfaat baik bagi masyarakat maupun lingkungan.

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Carbon sequestration on macroalgae through photosynthesis can contribute to the mitigation of climate change problem. This research aimed to analyse carbon sequestration potential on macroalgae *Kappaphycus striatum* with different harvested ages; i.e. young (25 days) and adult (60 days). Samples were collected randomly from off-bottom seaweed aquaculture system, at Alaang Village, Alor Island, East Nusa Tenggara. The parameter observed was carbon content determined by using gravimetric analysis. Growth rate measurement and light-dark bottle experiment were also conducted to be further analysed. Results showed that total area of seaweed aquaculture in Alaang Village was 1,552 m². According to our analysis, it was estimated that the carbon sequestration potential of macroalgae *Kappaphycus striatum* was 13.28 tonnes C/cycle for young and 26.63 tonnes C/cycle for adult. These results were equal to 66.07 tonnes C/ha/cycle and 125.51 tonnes C/ha/cycle, respectively. Therefore, the carbon sequestration potential of adult was higher about 32.78% than that of young. It can be concluded that the carbon sequestration potential was influenced by growth rate and primary productivity. Further study on sustainable management of seaweed aquaculture sites, by considering ecological and economic values, could potentially provide multiple functions both for human and ecosystem.