



Analisis Jejak Karbon Budidaya Ikan Lele (*Clarias sp.*) Kolam Bioflok sebagai Indikator Lingkungan

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INTISARI

Tren peningkatan produksi perikanan darat di Yogyakarta memiliki efek samping peningkatan emisi karbon di lingkungan, antara lain akibat penggunaan energi pada kolam bioflok. Penelitian ini bertujuan mengetahui nilai dan dampak dari jejak karbon serta langkah perbaikan terhadap jejak karbon budidaya ikan lele kolam bioflok Unit Usaha “Hasbuna” Pondok Pesantren Muhammadiyah *Boarding School*. Tahapan penelitian meliputi persiapan, observasi, pengumpulan data, analisis nilai jejak karbon input, dan perhitungan nilai jejak karbon setiap tahapan proses budidaya ikan lele. Nilai jejak karbon dihitung menggunakan metode *life cycle assesment* dengan ruang lingkup *cradle to gate*.

Hasil penelitian menunjukkan total jejak karbon budidaya lele kolam bioflok Unit Usaha “Hasbuna sebesar 0,2472 kg CO₂/kg lele. Nilai jejak karbon tertinggi terdapat pada proses pembesaran dari pakan komersial sebesar 0,1519 kg CO₂/kg lele (61,4067%) dan terendah pada penggunaan bahan bakar sebesar 0,0003 kg CO₂/kg lele (0,1214%). Dampak lingkungan yang ditimbulkan emisi karbon budidaya ikan lele kolam bioflok yaitu dapat meningkatkan suhu sebesar 1,1458 x10⁻¹⁹ °C per emisi yang dikeluarkan sejumlah 0,2472 kg CO₂/kg lele dan mengakibatkan berkurangnya jumlah sumber air terbarukan sebesar 8,4 x 10⁻¹⁹%. Perbaikan diberikan pada penggunaan energi listrik pada saat pembesaran. Penggunaan energi listrik dapat dikurangi dengan dengan menghidupkan aerator selama 12 jam sehari atau 50% dari penggunaan biasanya, sehingga kontribusi listrik menjadi 19,5282% atau berkurang 0,0372 kg CO₂/kg lele.

Kata kunci: bioflok, budidaya lele, jejak karbon, *life cycle assesment*

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Carbon Footprint Analysis in Biofloc Catfish (*Clarias sp.*) Aquaculture as Environment Indicator

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ABSTRACT

Increasing rate of fish aquaculture production in Yogyakarta has environmental issue emerges as since it also escalates carbon emission due to energy consumption, such as occurs in biofloc system. The aim of this study is to measure waste water quality through carbon footprint estimation in “Hasbuna” biofloc catfish aquaculture in Muhammadiyah Islamic Boarding School. This study was conducted in several stages of preparation, observation, data collection, carbon footprint input for analysis, and calculation of carbon footprint in each farming stages using life cycle assesment with cradle to gate scope. Results showed that the highest carbon footprint in “Hasbuna” of 0.1519 kg CO₂/kg (61.4067%) was detected during growing stage due to commercial feed consumption while the lowest of 0.0003 kg CO₂/kg (0.1214%) was caused by fuel consumption. The environmental impact caused by the carbon emission of catfish aquaculture in biofloc ponds is that it can increase temperature by 1.1458×10^{-19} °C per emission emitted amounting to 0.2472 kg CO₂ / kg and decrease renewable water resources by $8,4 \times 10^{-19}$ %. Improvements are given to the use of electrical energy during enlargement. The use of electrical energy can be reduced by using aerator for 12 hours a day or 50% of normal usage, so that the electricity contribution was 19.5282% or reduced by 0.0372 kg CO₂ / kg.

Keywords: biofloc, carbon footprint, catfish aquaculture, life cycle assesment

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