

INTISARI

Life Cycle Assessment (LCA) pada Budidaya Intensif Udang Vaname
(*Penaeus vannamei* Boone, 1931) di Wilayah
Pesisir Kabupaten Bantul

Penelitian ini bertujuan untuk mengetahui potensi dampak lingkungan yang dihasilkan dari proses budidaya udang vaname di wilayah pesisir Kabupaten Bantul melalui *life cycle assessment* (LCA) serta memberikan evaluasi dan rekomendasi terhadap dampak yang dihasilkan berdasarkan proses LCA. Batasan sistem pada penelitian ini yaitu *gate-to-gate* dengan inventarisasi berupa penggunaan pakan, kincir air, pompa air, bahan kimia, dan bahan aditif pakan. Data diambil dari tambak udang milik masyarakat dengan total 18 petakan. Penilaian dampak menggunakan CML-IA Baseline dengan kategori dampak *acidification potential* (AP), *eutrophication potential* (EP), *global warming potential* (GWP), *terrestrial ecotoxicity potential* (TETP), *human toxicity potential* (HTP), dan *marine aquatic ecotoxicity potential* (MAETP). Penelitian ini dilakukan pada tanggal 23 November 2023 - 2 Desember 2023. Data potensi dampak lingkungan dievaluasi menggunakan perangkat lunak openLCA dengan pendekatan endpoint. Hasil penelitian menunjukkan bahwa dampak AP sebesar 2,71E+01 kg SO₂ eq, EP sebesar 1,27E+01 kg PO₄ eq, GWP100 sebesar 6,24E+03 kg CO₂ eq, TETP sebesar 2,41E+01 kg 1,4-DCB eq, HTP sebesar 2,54E+03 kg 1,4-DCB eq, dan MAETP sebesar 7,69E+06 kg 1,4-DCB eq dengan kontributor terbesar pada setiap kategori dampak yaitu kincir air. Rekomendasi yang diberikan untuk mengurangi potensi dampak yang ditimbulkan dalam skala makro yaitu dengan menerapkan sumber energi terbarukan untuk menghasilkan listrik dalam skala makro. Pada skala *onfarm*, rekomendasi yang diberikan yaitu efisiensi penggunaan kincir air, pengoptimalan FCR dengan penggunaan pakan berkualitas, monitoring rutin terhadap pertumbuhan, suhu, serta *survival rate*, dan penerapan *biosecurity*.

Kata kunci: dampak lingkungan, *gate-to-gate*, *life cycle assessment* (LCA), udang vaname

ABSTRACT

Life Cycle Assessment (LCA) on Intensive Cultivation of Whiteleg Shrimp (*Penaeus vannamei* Boone, 1931) in the Coastal Area of Bantul Regency

This research aims to determine the potential environmental impacts resulting from the whiteleg shrimp cultivation process in the coastal area of Bantul Regency through a life cycle assessment (LCA) as well as providing evaluations and recommendations on the impacts produced based on the LCA process. The system limitation in this research is gate-to-gate with inventory in the form of feed use, water wheels, water pumps, chemicals and feed additives. Data was taken from community-owned shrimp ponds with a total of 18 plots. Impact assessment uses the CML-IA Baseline with impact categories acidification potential (AP), eutrophication potential (EP), global warming potential (GWP), terrestrial ecotoxicity potential (TETP), human toxicity potential (HTP), and marine aquatic ecotoxicity potential (MAETP). This research was conducted on 23 November 2023 - 2 December 2023. Potential environmental impact data was evaluated using openLCA software with an endpoint approach. The research results show that the impact of AP is $2.71\text{E}+01$ kg SO₂ eq, EP is $1.27\text{E}+01$ kg PO₄ eq, GWP100 is $6.24\text{E}+03$ kg CO₂ eq, TETP is $2.41\text{E}+01$ kg 1,4-DCB eq, HTP was $2.54\text{E}+03$ kg 1,4-DCB eq, and MAETP was $7.69\text{E}+06$ kg 1,4-DCB eq with the largest contributor in each impact category being water wheels. The recommendation given to reduce the potential impact on a macro scale is by implementing renewable energy sources to produce electricity on a macro scale. On an on-farm scale, the recommendations given are efficient use of water wheels, optimizing FCR by using quality feed, routine monitoring of growth, temperature and survival rate, and implementing biosecurity.

Keywords: environmental impact, gate-to-gate, life cycle assessment (LCA), whiteleg shrimp