

PENERAPAN TEKNOLOGI *AERATION INJECTION* PADA KERAMBA JARING APUNG UNTUK MENDUKUNG PENINGKATAN KUALITAS PERAIRAN DAN PENGELOLAAN WADUK CENGKLIK BERKELANJUTAN

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ABSTRAK

Budidaya perikanan menggunakan metode keramba jaring apung memicu terjadinya eutrofikasi di Waduk Cengklik. Hal ini terjadi karena peningkatan *nutrient* akibat pakan yang tidak termakan oleh ikan dan feses mengendap di dasar perairan. Adanya peningkatan jumlah keramba juga berpotensi menurunkan kualitas air terutama oksigen terlarut di perairan. Tujuan dari penelitian ini adalah (1) menganalisa tingkat status mutu kualitas air dan status trofik Waduk Cengklik, (2) mengidentifikasi pengaruh penerapan teknologi *aeration injection* terhadap kualitas perairan Waduk Cengklik, dan (3) mengidentifikasi kondisi sosial-ekonomi petani keramba terhadap keberadaan keramba jaring apung.

Pengukuran kualitas air dilakukan tanggal 12 Agustus 2022 dengan 9 titik lokasi pengambilan sampel dan 10 parameter (suhu, pH, kecerahan, TSS, DO, BOD, COD, total-N, total-P dan klorofil-a perairan), kemudian hasil pengukuran dianalisa menggunakan metode indeks pencemaran (PI) dan metode *trophic level index* (TLI). Disisi lain, pengamatan teknologi *aeration injection* dilaksanakan sebanyak 3 kali yaitu 5, 7 dan 9 September 2022. Pengamatan ini dilakukan pada satu petak keramba berukuran 36 m² yang diaerasi selama 8 jam dan keramba yang tidak diaerasi sebagai kontrol. Parameter yang digunakan pada pengamatan teknologi *aeration injection* adalah pH, suhu, nitrat, nitrit, ammonia dan total-P. Pengamatan kondisi sosial-ekonomi masyarakat juga dilakukan melalui wawancara mendalam dengan petani keramba.

Hasil penelitian menunjukkan status mutu air Waduk Cengklik termasuk dalam kategori tercemar ringan dan tingkat kesuburan yaitu mesotrofik (kesuburan sedang). Penambahan teknologi *aeration injection* pada keramba ikan dapat meningkatkan oksigen terlarut sebanyak 42-58% lebih besar daripada keramba yang tidak diaerasi. Pengaruh ini juga memberikan dampak langsung terhadap perubahan pH menjadi lebih basa dan dampak tidak langsung terhadap nitrogen dan total-P. Berdasarkan hasil wawancara dan pengamatan, teknologi *aeration injection* dapat diterima oleh petani keramba namun teknologi ini membutuhkan instalasi listrik di tengah waduk sehingga menjadi hambatan yang memerlukan pengembangan lebih lanjut.

Kata Kunci: *Aeration Injection*, Eutrofikasi, Kualitas Air, Sosial-Lingkungan, Waduk Cengklik

APPLICATION OF AERATION INJECTION TECHNOLOGY IN FLOATING NET CAGES TO SUPPORT IMPROVEMENT OF WATER QUALITY AND SUSTAINABLE CENGLIK RESERVOIR MANAGEMENT

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ABSTRACT

Aquaculture using the floating net cage method triggers eutrophication in the Cengklik Reservoir. This happens because of an increase in nutrients due to feed that is not eaten by fish and feces settles at the bottom of the waters. An increase in the number of cages also has the potential to reduce water quality, especially dissolved oxygen in the waters. The aims of this study were (1) to analyze the level of water quality status and trophic status of the Cengklik Reservoir, (2) to identify the effect of applying aeration injection technology on the water quality of the Cengklik Reservoir, and (3) to identify the socio-economic conditions of cage farmers on the existence of net cages floating.

Water quality measurements were carried out on August 12, 2022 with 9 sampling points and 10 parameters (temperature, pH, brightness, TSS, DO, BOD, COD, total-N, total-P and chlorophyll-a), then the measurement results were analyzed using pollution index method (PI) and trophic level index (TLI) method. On the other hand, observations of aeration injection technology were carried out 3 times, namely 5, 7 and 9 September 2022. These observations were carried out on a 36 m² cage plot that was aerated for 8 hours and non-aerated cages as a control. The parameters used in the observation of aeration injection technology are pH, temperature, nitrate, nitrite, ammonia and total-P. Observation of the socio-economic conditions of the community was also carried out through in-depth interviews with cage farmers.

The results showed that the water quality status of the Cengklik Reservoir was included in the slightly polluted category and the fertility level was mesotrophic (moderate fertility). The addition of aeration injection technology to fish cages can increase dissolved oxygen by 42-58% greater than non-aerated cages. This effect also has a direct effect on changes in pH to become more alkaline and an indirect effect on nitrogen and total-P. Based on the results of interviews and observations, aeration injection technology can be accepted by cage farmers but this technology requires electrical installation in the middle of the reservoir so that it becomes an obstacle that requires further development.

Kata Kunci: *Aeration Injection*, *Cengklik Reservoir*, *Eutrophication*, *Socio-Environment*, *Water Quality*