Peran Tanaman Hias dalam Pengolahan Limbah Cair Domestik Pantai Suluban Uluwatu, Bali

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INTISARI

Constructed Wetland (CW) dikenal sebagai salah satu sistem pengolahan limbah cair biologis dengan berbagai keunggulan. Penelitian ini menerapkan lima jenis tanaman hias dalam CW skala besar guna mengolah limbah cair domestik (air abu-abu) di Pantai Suluban Uluwatu, Bali. Perlakuan terdiri atas *unplanted* (non tanaman/CW1) dan *planted* (dengan tanaman). Tujuan penelitian ini yaitu: (1) Menguji efektivitas tanaman hias *I. pseudacorus* (CW2), *C.bicolor* (CW3), *R. discolor* (CW4), *S. trifasciata* (CW5), dan *H.psittacorum* (CW6) terhadap parameter uji (Nitrat, Fosfat, BOD, COD, TSS, dan Minyak dan Lemak) (2) Mengkaji *uptake* nutrien (Total N dan Fosfat) pada *above-ground biomass* sebelum dan sesudah dialiri limbah (3) Mengkaji pertumbuhan dan perkembangan tanaman dalam sistem (4) Mengkaji motif masyarakat dalam keterlibatan pemeliharaan sistem. Uji laboratorium dilanjutkan dengan interpretasi deskriptif kuantitatif guna menjawab tujuan satu dan dua. Analisis statistik *T-Test Paired* dilakukan guna menjawab tujuan tiga, sedangkan metode sensus dilakukan guna mencapai tujuan keempat. Hasil menunjukkan kemunculan efektivitas negatif dan positif pada setiap perlakuan. Nilai efektivitas tertinggi untuk CW1, CW2, CW3, CW4, CW5, CW6 berturut-turut adalah parameter Minyak dan Lemak (63,63%), BOD (90,66%), Nitrat (83,55%), BOD (80%), BOD (82,88%) dan Fosfat (89,93%). Kelima tanaman mampu menyerap nutrien, tetapi hanya *Iris pseudacorus*, *Caladium bicolor*, dan *Rhoe discolor* yang menunjukkan pertumbuhan dan perkembangan yang berbeda signifikan (baik). Motif jenis afektif diduga kuat memengaruhi tindakan sosial masyarakat dalam pemeliharaan sistem. Ekstensi aklimatisasi dengan memperbesar HRT (*Hydraulic Retention Time*) serta kepedulian dari pemangku kepentingan setempat berpengaruh terhadap kinerja dan keberlanjutan operasional sistem.

Kata Kunci : *Constructed Wetland*, efektivitas, *Above-Ground Biomass*, *uptake* nutrien, motif masyarakat

The Ornamental Plants' Role in Treating Greywater (A case study for Suluban Uluwatu Beach, Bali)

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ABSTRACT

Constructed Wetland (CW) is known as one of the biological wastewater treatment systems with various advantages. This study examines the effectiveness of five types of ornamental plants in a full-scale CW to treat greywater in the Suluban Uluwatu Beach, Bali. The treatment consists of unplanted and planted. The objectives of this study are: (1) investigating the effectiveness of I. pseudacorus, C. bicolor, R. discolor, S. trifasciata, and H.psittacorum towards Nitrates, Phosphates, BOD5, COD, TSS, and Oil and Grease. (2) examining nutrient uptake (Total N and Phosphate) in above-ground biomass before and after the system ran (3) assessing plant growth and development in the system (4) digging community motives related to the involvement of system caring. A Laboratory tests followed by quantitative descriptive interpretations were conducted to attain the 1st and 2nd objective. Statistical analysis of T-Test Paired was done to obtain the 3rd objectives, while the questionnaire and interview methods were conducted to achieve the fourth goal. The result showed the emergence of negative and positive effectiveness in each of treatments. The highest removal efficiency for CW1, CW2, CW3, CW4, CW5, CW6 were O&G (63.63%), BOD (90.66%), Nitrate (83.55%), BOD (80%), BOD (82.88%) and Phosphate (89.93%) respectively. The five ornamental plants were able to uptake the nutrients, but only Iris pseudacorus, Caladium bicolor, and Rhoe discolor revealed significant (good) growth and development. Affective motive was thought to strongly influences the social actions of the community in caring for the system. Acclimatization extensions by enlarging HRT and the concern of local stakeholders influence the performance and operational sustainability of the system.

Keywords: *Constructed Wetland, removal efficiency, Above-Ground Biomass, plant uptake, community's motive*