INTISARI

Pertumbuhan penduduk di Indonesia yang terus meningkat menyebabkan adanya peningkatan terhadap berbagai macam kebutuhan. Peningkatan kebutuhan ini berimplikasi pada peningkatan volume sampah yang dihasilkan masyarakat. Pemerintah Kota Bogor dan Kabupaten Bogor telah menyediakan Tempat Pemrosesan Akhir (TPA) Galuga sebagai upaya penanganan sampah rumah tangga dan sampah dari tempat usaha yang dihasilkan. Limbah yang dihasilkan dari industri di sekitar TPA Galuga diantaranya adalah limbah serbuk gergaji dan sabut kelapa. Selain permasalahan lingkungan berupa timbunan sampah, fasilitas TPA Galuga berupa Instalasi Pengolahan Lindi (IPL) juga belum terkelola dengan baik, sehingga menghasilkan kualitas air lindi yang fluktuatif. Penelitian ini bertujuan untuk mengatasi permasalahan lindi dan limbah padat dengan *constructed wetland*.

Demi mendapatkan sistem *constructed wetland* yang paling baik, maka dibuat 2 alternatif yang berbeda, yaitu *constructed wetland* konvensional dan *constructed wetland* dengan pemanfaatan limbah padat berupa serbuk gergaji dan sabut kelapa sebagai media filtrasi. Air lindi diolah di *constructed wetland* dengan memanfaatkan tanaman lokal Kota Bogor, yaitu tanaman pandan.

Hasil penelitian menunjukkan *constructed wetland* dengan *Hydraulic Loading Rate* (H_{LR}) 0,102 m/hari mampu menurunkan konsentrasi *Biological Oxygen Demand* (BOD), *Chemical Oxygen Demand* (COD), nitrat, dan fosfat mencapai 87,3%, 87,7%, 86%, dan 99,7% pada *constructed wetland* konvensional serta mencapai 77,1%, 76,9%, 98%, dan 98,9% pada *constructed wetland* dengan pemanfaatan limbah padat. Dari hasil analisis, nilai *Total Suspended Solid* (TSS) masih melampaui baku mutu akibat partikel tersuspensi yang ikut terbawa pada air, maka untuk meningkatkan kinerja *constructed wetland*, diperlukan waktu detensi yang lebih lama serta penambahan bak kontrol setelahnya. *Constructed wetland* yang ramah lingkungan ini menjadi langkah awal dalam mewujudkan pembangunan berkelanjutan yang berwawasan lingkungan.

Kata kunci: *Constructed Wetland*, Air Lindi, Pemanfaatan Limbah, Pembangunan Berkelanjutan

ABSTRACT

Population growth in Indonesia continues to increase which causes an increase in daily needs and it affects the increase in the amount of waste produced by the residents. The Bogor City and Bogor Regency Government have provided Galuga Landfill to handle household and business waste generated by the residents of Bogor City and Bogor Regency. Waste generated from industries around the Galuga TPA includes sawdust and coconut husk waste. In addition to environmental problems in the form of landfills, the Leachate Treatment Plant (IPL) facility in Galuga Landfill is still lacking operational and management, resulting in the fluctuating leachate quality. This study aims to solve the problem of leachate and solid waste with constructed wetlands.

To get the best system, two different alternatives were made, namely conventional constructed wetlands and constructed wetlands that utilize solid waste in the form of sawdust and coconut fiber as a filtration media. The leachate is treated in a constructed wetland by using pandan plant.

The results showed that constructed wetlands with Hydraulic Loading Rate (HLR) of 0.102 m/day were able to reduce Biological Oxygen Demand (BOD), *Chemical Oxygen Demand* (COD), *nitrate, and phosphate concentrations to 87.3%, 87.7%, 86%, and 99.7% in a conventional constructed wetland, also to 77.1%, 76.9%, 98%, and 98.9% in constructed wetland using solid waste. From the results of the analysis, the Total Suspended Solid* (TSS) *value still exceeds the quality standard due to suspended particles carried in the water. Therefore, to improve the performance of constructed wetlands, a longer detention time is required and the addition of control tank afterwards. This ecological constructed wetland is the first step in achieving sustainable development.*

Keywords: *Constructed Wetland, Leachate, Waste Utilization, Sustainable Development*