Simulasi Daur Ulang Pengelolaan Sampah Organik Menggunakan Teknologi Black Soldier Fly (BSF) - Studi Kasus: Desa Padamukti & Desa Cibodas = Simulation of Organic Waste Management Recycler with Black Soldier Fly (BSF) Technology â Study Case: Desa Padamukti & Desa Cibodas

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Abstrak

Peningkatan timbulan sampah yang terus terjadi menimbulkan tantangan pengelolaan sampah seperti yang terjadi di Kabupaten Bandung, dimana hanya mampu mengelola sebesar 56,9% sampah yang dihasilkan. Pada penelitian ini, dilakukan analisis timbulan dan komposisi sampah pada Desa Padamukti & Desa Cibodas sebagai desa percontohan pengelolaan sampah dengan loop tertutup dalam pembangunan Ekowisata Citarik. Timbulan sampah yang bersumber dari rumah tangga, toko dan warung makan berturut-turut sebesar 0,532 Kg/Orang/Hari, 1,026 Kg/Unit/Hari dan 4,357 Kg/Unit/Hari. Komposisi sampah organik pada Desa Padamukti & Desa Cibodas yaitu sebesar 44% dari total keseluruhan sampah. Sampah organik didominasi oleh sampah sisa makanan sebesar 28%. Melalui sistem dinamis, dinilai keefektifan pengelolaan sampah berdasarkan nilai akumulasi sampah tidak terkelola di sumber maupun TPS. Simulasi dilakukan dengan melakukan skeanario eksisting, realistis dan optimis. Skenario perbaikan dilakukan dengan meningkatkan operasional pengumpulan, pengangkutan serta tingkat daur ulang pengolahan sampah organik. Skenario optimis merupakan skenario paling efektif dimana melalui kegiatan pengumpulan 1 hari sekali dan pengangkutan 1 minggu sekali serta tingkat daur ulang BSF dan komposting berturut-turut sebesar 100% dan 72%. Skenario optimis dapat mengelola keseluruhan sampah pada sumber. Meskipun begitu, masih terdapat akumulasi sampah di TPA mencapai 112 ton pada hari ke 365. Pewadahan sampah pada sumber membutuhkan minimal 4 unit wadah sampah. Luas lahan TPS yang dibutuhkan untuk menampung akumulasi sampah yaitu 546 m2. Sedangkan, 3,1 ton sampah makanan/hari dapat diolah menggunakan BSF dan menghasilkan 481 Kg larva segar/hari

.....The continuous increase in waste generation poses challenges for waste management as happened in Bandung Regency where it is only able to manage 56.9% of the waste generated. In this study, an analysis of waste generation and composition was carried out in Padamukti Village & Cibodas Village as pilot villages for closed-loop waste management in Citarik Ecotourism development. The generation of waste originating from households, shops and food stalls is 0.532 kg/person/day, 1.026 kg/unit/day and 4,357 kg/unit/day. The composition of organic waste in Padamukti Village & Cibodas Village is 44% of the total waste. Organic waste is dominated by food waste by 28%. Through a dynamic system, the effectiveness of waste management is assessed based on the accumulated value of unmanaged waste at the source and TPS. Simulations are carried out by carrying out existing, realistic and optimistic scenarios. The improvement scenario is carried out by increasing the collection, transportation and recycling operations of organic waste processing. The optimistic scenario is the most effective scenario where through collection activities once a day and transportation once a week and the BSF recycling and composting rates are 100% and 72%, respectively. The optimistic scenario can manage the entire waste at the source. Even so, there is still accumulation of waste in the TPA reaching 112 tons on the 365th day. Storage at the source requires a

minimum of 4 units of waste containers. The TPS land area needed to accommodate the accumulated waste is 546 m2. Meanwhile, 3.1 tons of food waste/day can be processed using BSF and produce 481 kg of fresh larvae/day