

***ANALISIS SPASIAL PEMILIHAN LOKASI TEMPAT PENGOLAHAN
SAMPAH BERBASIS REDUCE, REUSE, RECYCLE (TPS 3R) DI KAWASAN
PENYANGGA WILAYAH PERKOTAAN SINGARAJA***

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INTISARI

Pertumbuhan penduduk menyebabkan peningkatan produksi sampah harian terutama di area perkotaan seperti Singaraja. Banyak sampah yang tidak tertangani akibat kurang memadainya fasilitas pengolahan sampah di wilayah perkotaan Singaraja. Oleh karena itu, pengadaan fasilitas Tempat Pengolahan Sampah berbasis *Reduce, Reuse, Recycle* (TPS 3R) dapat menjadi solusi. Namun, pengadaan TPS 3R secara langsung di dalam wilayah perkotaan Singaraja tidak dapat dilakukan karena terbentur regulasi daerah. Oleh karena itu, pengadaan TPS 3R dapat dilakukan di kawasan penyangga urban sehingga perlu dilakukan analisis pemilihan lokasi. Studi ini memanfaatkan Sistem Informasi Geografis (SIG) dikombinasikan dengan *Analytical Hierarchy Process* (AHP) untuk memetakan kesesuaian lokasi TPS 3R berdasarkan 7 kriteria. Lebih lanjut, dilakukan estimasi potensi pengurangan volume sampah melalui pengadaan TPS 3R yang dianalisis. Hasil analisis AHP menunjukkan kerawanan banjir menjadi kriteria dengan bobot tertinggi pada nilai 23,8%, penutup dan penggunaan lahan 21,1%, jarak ke jalan 13,3%, kondisi jalan 11,2%, kepadatan permukiman 10,9%, jarak ke permukiman 10,3%, dan jumlah penduduk 9,4%. Model AHP yang dibangun memiliki nilai Consistency Ratio (CR) 3,2% sehingga dianggap valid. Hasil akhir menunjukkan ditemukannya 52 lokasi yang sesuai untuk pengadaan TPS 3R yang tersebar di 8 desa. Menggunakan skema ideal, 52 TPS 3R berpotensi mengurangi 161,498 m³ sampah harian. Menggunakan skema realistik, 8 TPS 3R berpotensi mengurangi 24,846 m³ sampah harian. Hasil studi dapat menyumbangkan informasi terkait perencanaan kebutuhan fasilitas pengelolaan sampah di kawasan perkotaan.

Kata kunci: TPS 3R, SIG, AHP, Pemilihan Lokasi

***SITE SELECTION ANALYSIS OF REDUCE, REUSE, RECYCLE - BASED
SOLID WASTE PROCESSING FACILITY (3RSWPF) IN SINGARAJA PERI-
URBAN AREA***

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ABSTRACT

The growth of the population has led to an increase in solid waste daily, particularly in urban areas. The urban area of Singaraja is encountering difficulties in waste management due to the excessive amount of untreated waste surpassing the capacity of processing facilities. Employing the Reduce, Reuse, Recycle Based Solid Waste Processing Facility (3RSWPF) can diminish the volume of waste at the source. However, regional regulations prevented the facility from being constructed directly in the urban area. Therefore, the peri-urban area was deemed appropriate for 3RSWPF. Conducting a site suitability analysis was necessary to identify the most ideal locations for 3RSWPF. This study employed the Geographic Information System (GIS) analysis, paired with Analytical Hierarchy Process (AHP) to determine seven suitability criteria. Furthermore, estimation of waste reduction potential from the suggested 3RSWPF facilities was conducted. A pairwise comparison matrix was used to determine the weights of each criterion. These criteria include flood-prone areas with an analysis weight of 23.8%, followed by land use/land cover (LULC) type at 21.1%, proximity to road at 13.3%, road classification at 11.2%, building density at 10.9%, proximity to settlement at 10.3% and population at 9.4%. The AHP model revealed a consistency ratio (CR) of 3.2%, providing evidence of the model's validity and reliability. Based on the criteria's weights, a 3RSWPF suitability map was created using weighted overlay. Utilizing field validation method, this study found 52 suitable locations for 3RSWPF, distributed in 8 villages. Using ideal scheme, 52 facilities potentially reduce 161,498 m³ waste daily. Using realistic scheme, 8 facilities potentially reduce 24,846 m³ waste daily. The study results provide a spatial insight regarding the necessity of municipal solid waste facilities.

Keyword: 3RSWPF, GIS, AHP, Site Selection