# STUDI TIMBULAN, KOMPOSISI, KARAKTERISTIK DAN POTENSI DAUR ULANG SAMPAH KECAMATAN PANYABUNGAN KABUPATEN MANDAILING NATAL

## TUGAS AKHIR

Sebagai salah satu syarat untuk menyelesaikan

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# ABSTRAK

*Sistem pengelolaan sampah di Kecamatan Panyabungan sampai saat ini belum dikelola dengan baik dan belum memiliki data persampahan. Tujuan penelitian ini untuk mengukur dan menganalisis data timbulan, komposisi, karakteristik dan potensi daur ulang sampah. Metode pengambilan sampel dan penentuan jumlah sampel dilakukan berdasarkan SNI 19-3964-1994. Hasil penelitian rata-rata timbulan sampah domestik berdasarkan pendapatan high income 0,574 kg/o/h atau 2,357 l/o/h, medium income 0,381 kg/o/h atau 1,868 l/o/h, low income 0,340 kg/o/h atau 1,787 l/o/h. Satuan timbulan non domestik adalah 0,027 kg/o/h atau 0,190 l/o/h. Satuan timbulan Kecamatan Panyabungan yaitu 0,503 kg/o/h atau 2,234 l/o/h dengan total timbulan sampah yang dihasilkan sebesar 48,459 ton/h atau 215,01 $m^3$/h. Komposisi sampah didominasi oleh sisa makanan (56,22%) dan plastik (18,11%). Rata-rata massa jenis sampah domestik dan non domestik masing-masing adalah 0,212 kg/l dan 0,165 kg/l. Karakteristik kimia sampah berturut turut yaitu kadar air 32,59%; kadar volatil 59,55%; kadar abu 4,57%; fixed carbon 3,29%; dan rasio C/N 19,35. Nilai biodegrable sampah Kecamatan Panyabungan yang didapatkan yaitu 10,19% kadar lignin dan 54,47% fraksi biodegradabilitas. Potensi daur ulang sampah Kecamatan Panyabungan yaitu sampah sisa makanan 82,75%; sampah plastik 87,03%; sampah kertas 70,24%; sampah kaca 89,75%; sampah logam 88,89%. Sistem pengolahan sampah yang direkomendasikan untuk sampah mudah terurai dengan cara pembudidayaan larva ulat maggot dan sampah tidak terurai dengan cara guna daur ulang dan guna ulang sampah yang memiliki nilai ekonomi dan dapat dimanfaatkan kembali.*

***Kata kunci**: Karakteristik, Kecamatan Panyabungan, komposisi, potensi daur ulang, timbulan sampah*

# *ABSTRACT*

*The waste management system in Panyabungan Subdistrict had not been properly organized and lacked comprehensive data regarding waste generation. Consequently, this study was undertaken to measure and analyze the waste generation rate, composition, characteristics, and recycling potential in the area. Sampling and sample size determination were conducted in accordance with SNI 19-3964-1994. The results revealed that the average domestic waste generation rate reached 0.574 kg/person/day (2.357 L/person/day) for high-income households, 0.381 kg/person/day (1.868 L/person/day) for medium-income households, and 0.340 kg/person/day (1.787 L/person/day) for low-income households. In contrast, the non-domestic waste generation rate was 0.027 kg/person/day (0.190 L/person/day). Overall, the total waste generation in Panyabungan Subdistrict amounted to 0.503 kg/person/day (2.234 L/person/day), equivalent to 48.459 tons/day or 215.01 m³/day. In terms of composition, food waste accounted for the largest proportion at 56.22%, followed by plastic at 18.11%. The average density of domestic waste was 0.212 kg/L, while non-domestic waste averaged 0.165 kg/L. Regarding chemical characteristics, the waste contained 32.59% moisture, 59.55% volatile matter, 4.57% ash, and 3.29% fixed carbon, with a carbon-to-nitrogen (C/N) ratio of 19.35. The biodegradability analysis indicated a lignin content of 10.19% and a biodegradability fraction of 54.47%. Furthermore, the recycling potential was estimated at 82.75% for food waste, 87.03% for plastic, 70.24% for paper, 89.75% for glass, and 88.89% for metal. Based on these findings, maggot larva cultivation was recommended for managing biodegradable waste, while recycling and reusing were proposed for non-biodegradable waste with economic value.*



***Keywords**: Characteristics, Composition, Panyabungan District, Recycling Potential, Solid Waste*