

RINGKASAN

Pengelolaan sampah di Kota Jambi diatur melalui Peraturan Daerah Nomor 5 Tahun 2020 untuk mewujudkan sistem yang efektif dan efisien. Namun, implementasinya masih menghadapi kendala seperti keterbatasan fasilitas, keberadaan TPS liar, serta berkurangnya jumlah armada operasional akibat kerusakan. Kondisi ini berdampak pada beban kerja petugas, tingginya konsumsi bahan bakar, dan rute pengangkutan yang belum optimal. Oleh karena itu, diperlukan kajian teknis untuk merancang rute yang lebih efisien.

Penelitian ini menggunakan metode *Saving Matrix* yang dipadukan dengan prosedur *Nearest Neighbor*. Data diperoleh melalui observasi lapangan, wawancara, serta dokumentasi di Dinas Lingkungan Hidup (DLH) Kota Jambi. Analisis difokuskan pada tiga armada *dump truck* yang beroperasi pada ritasi sore yang melayani daerah Pasar Kota Jambi, dengan pertimbangan muatan yang belum mencapai kapasitas optimal.

Pada kondisi eksisting, tiga armada *dump truck* menempuh jarak 86,83 km dengan konsumsi BBM 17,35 liter/hari dan biaya Rp117.976/hari. Setelah dianalisis dengan metode *Saving Matrix*, rute dapat disusun ulang menjadi dua armada dengan total jarak 58,98 km, konsumsi BBM 11,79 liter/hari, dan biaya Rp80.172/hari. Analisis lanjutan melalui prosedur *Nearest Neighbor*, jarak semakin berkurang menjadi 58,42 km dengan konsumsi BBM 11,68 liter/hari dan biaya Rp79.424/hari. Efisiensi yang dicapai sebesar 32–33% dibandingkan kondisi eksisting.

Volume sampah ritasi sore sebesar 7,02 m³ masih sesuai dengan kapasitas *dump truck* 7 m³ per unit, sehingga dua armada hasil optimasi mampu mengangkut seluruh sampah tanpa kendala. Hal ini layak dilakukan karena ketiga rute eksisting berada dalam satu wilayah pelayanan, yaitu Pasar Angso Duo Kota Jambi. Dengan demikian, penerapan metode *Saving Matrix* memiliki potensi untuk menekan jumlah armada, mengurangi biaya operasional, dan meningkatkan pemanfaatan kapasitas angkut, sehingga sistem pengangkutan sampah Kota Jambi lebih ekonomis dan berkelanjutan.

SUMMARY

Waste management in Jambi City is regulated by Regional Regulation Number 5 of 2020 to establish an effective and efficient system. However, its implementation still faces challenges such as limited facilities, the presence of illegal temporary disposal sites (TPS), and a reduced number of operational fleets due to vehicle damage. These conditions impact workers' workload, high fuel consumption, and non-optimal transportation routes. Therefore, a technical study is needed to design more efficient routes.

This study employs the Saving Matrix method combined with the Nearest Neighbor procedure. Data were obtained through field observations, interviews, and documentation from the Environmental Agency (DLH) of Jambi City. The analysis focuses on three dump truck fleets operating during the afternoon shifts serving the Pasar area of Jambi City, considering that their loads have not yet reached optimal capacity.

In the existing condition, the three dump trucks covered a distance of 86.83 km with a fuel consumption of 17.35 liters/day and a cost of Rp117,976/day. After being analyzed using the Saving Matrix method, the routes were reorganized into two fleets with a total distance of 58.98 km, fuel consumption of 11.79 liters/day, and a cost of Rp80,172/day. Through further analysis with the Nearest Neighbor procedure, the distance was further reduced to 58.42 km with a fuel consumption of 11.68 liters/day and a cost of Rp79,424/day. The efficiency achieved was 32–33% compared to the existing condition.

The afternoon trip waste volume of 7.02 m³ is still within the dump truck capacity of 7 m³ per unit, so the two optimized fleets can transport all waste without exceeding the limit. This arrangement is considered feasible since the three existing routes are located within the same service area, namely Pasar Angso Duo in Jambi City. Thus, the application of the Saving Matrix method has the potential to reduce the number of fleets, lower operational costs, and improve load capacity utilization, making the waste transportation system in Jambi City more economical and sustainable.