Assessment on Layout of Waste Management Facilities and Parameter Analysis on Collection Vehicles: A Case Study in Chanayetharzan

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Abstract:

Waste collection and transportation account for up to 70% of total costs in municipal solid waste management (MSWM). Strategically placing waste collection facilities is essential for effective management. This study examined the waste management facilities in Chanayetharzan township, Mandalay City in Myanmar, using ArcGIS 10.8.2. There are 32 dustbin locations with 44 dustbins - small (2-ton) and large (5-ton), with one to three bins at each site. The fleet consists of 33 trucks and 38 tricycles. Staff include 2 to 3 operators for compactors, 2 to 4 for vacuum trucks, and one for each tricycle. Tricycles have one day off weekly, while trucks operate daily. The fleet uses diesel for vacuum trucks, premium diesel for compactors, and gasoline for tricycles. Weekly fuel consumption is 556.67 liters of premium diesel and 381.9 liters of standard diesel for trucks, and 699 liters of gasoline for tricycles. Tricycles move about 156.54 tons of waste to transfer stations, while trucks carry around 737.1 tons to the landfill. Trucks travel 9,710.28 km, while tricycles cover 3,988.95 km weekly. This usage results in CO2 emissions of 15.76 metric tons per week, totaling approximately 63.04 metric tons monthly. To enhance waste management in Mandalay, it is crucial to invest in infrastructure and boost public participation.

Keywords:

Waste management facilities, collection vehicles, fuel usage, emissions, Chanayaetharzan.