



An Analyzed Survey Report on Municipal Solid Waste Management System

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DESCRIPTION

The world generates 2.01 billion tons of municipal solid waste each year, of which at least 33% with extreme caution are not managed in an environmentally safe manner. Worldwide, the amount of waste generated per person per day averages 0.74 kg, but varies widely, from 0.11 kg-4.54 kg. Despite making up only 16% of the world's population, high-income countries generate about 34%, or 683 million tons of global waste. Looking to the future, global waste is expected to reach 3.40 billion tons by 2050, more than double the population growth over the same period. In general, there is a positive correlation between waste generation and income level. The amount of waste generated daily per capita in high-income countries is expected to increase by 19% by 2050 when compared with low and middle-income countries, where an increase of about 40%. Waste generation initially declines at the lowest income level, then increases at a faster rate due to the change in additional income at the lower income level than at the high income level. The total amount of waste generated in low-income countries is expected to more than triple by 2050. East Asia and the Pacific region generates most of the waste in the world, at 23%, and the Middle East and North Africa are the absolute least productive.

Waste collection is an important step in waste management, but rates vary widely across income levels, with middle and high income countries providing universal waste collection services access. Low-income countries collect about 48% of their waste in cities, but this proportion drops significantly to 26% outside urban areas. Across all regions, sub-Saharan Africa collects about 44% of waste while Europe, Central Asia and North America collect at least 90% of waste. The composition of waste varies across income levels, reflecting different consumption patterns. High-income countries generate relatively little food and green waste, accounting for 32% of total waste, and generate a lot of dry waste that can be recycled, including plastic, paper, cardboard, metal and glass, accounting for 51% of the total waste. Middle and low income countries generate 53% and 57% of food and green waste, respectively, with the proportion of organic waste increasing as economic development declines. In

low-income countries, recyclable materials account for only 20% of waste. Across regions, there is not much diversity in waste streams other than income appropriate ones. On average all regions generate about 50% of organic waste, with the exception of Europe, Central Asia and North America, which produce higher amounts of dry waste.

There is a common misconception that technology is the solution to the growing and unmanaged waste problem. Technology is not a panacea and is often just one factor to consider when managing solid waste. Countries that undergo open dumping and other rudimentary waste management methods are more likely to succeed when they choose locally appropriate solutions. Globally, most waste is currently dumped or disposed of in a landfill. About 37% of waste is disposed of in landfills, including 8% in controlled landfills with landfill gas collection systems. Open-pit landfills account for about 31% of the waste, 19% is recovered by recycling and composting, and 11% is incinerated for final treatment. Appropriate waste disposal, such as controlled landfills or more strictly operated facilities, is almost exclusively the domain of high middle income countries. Low-income countries often apply open dumping; 93% of waste is dumped in low income countries and only 2% in high income countries. Three regions openly dump more than half of their waste: the Middle East and North Africa, Sub-Saharan Africa, and South Asia. Upper middle income countries have the highest proportion of waste going to landfill of 54%. This proportion drops in high income countries to 39%, with 36% of waste going to recycling and composting and 22% going to incineration. Incineration is mainly used in countries with large capacity, high income and limited resources.

Based on the volume of waste generated, its composition, and how it is managed, an estimated 1.6 billion metric tons of carbon dioxide (CO₂) equivalent greenhouse gas emissions are generated from treatment and disposal of solid waste by 2016, which is 5% of global emissions. The main reason is due to waste treatment in open-air landfills that do not have landfill gas collection systems.

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In most countries, solid waste management is generally a local responsibility, and nearly 70% of countries have established organizations responsible for policy and regulatory development.

Financing solid waste management systems presents a significant challenge, even higher as capital investment and operating costs must be accounted from the outset. In high-income countries,

the operating costs of integrated waste management, including collection, transportation, treatment and disposal, often exceed \$100 per ton. Low-income countries spend less in absolute terms on waste management activities, at a cost of about 35 USD and sometimes more, but these are much more difficult to recover costs.