Chapter 13

Environmental Recycling System (ERS): An Emerging Approach to Solid Waste Management

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ABSTRACT

A lot of solid waste is generated in every country of the world. Among various disposal methods used for management of solid waste, open dumping is mostly used in many countries, especially developing countries. Due to open dumping, the environment becomes polluted. It also creates aesthetic problems at the site. Industrial and agricultural wastes are simple to handle being of specific characteristics. This chapter describes in detail the composition of municipal solid waste, various problems arising due to solid waste, approaches used for solid waste management, and environmental recycling system (ERS). ERS, its components, and methods for segregation of waste have also been discussed in detail in this chapter.

INTRODUCTION

Unplanned growth may result into lack of space, generation of pollution and solid waste disposal problems. Municipal solid waste is considered as a complex waste which contains different physical and chemical constituents. The type and composition of solid waste is dependent upon type of the consumer products, culture, climate, regulation of country, life quality etc. While selecting any method for management of waste, the information about the constituents of waste and its composition becomes necessary. It also
determines the frequency of collection of waste and method used for disposal of waste. Generally solid waste in any country includes organic matter, plastic, waste of wood, paper, glass waste, metallic waste etc. Global average for generation of solid waste is around 0.6 kg/capita/day. However waste generation rate as high as 2.7 to 4.0 kg/capita/day has been reported in case of developed countries.

It has been observed that with urbanization of any country composition of waste also changes. It has increased amount of waste including packaging waste, paper waste, plastic etc. It has been reported that in Delhi, capital of India, about 6000 tons of waste is generated currently which has been estimated to increase up to 15000 tons per day by 2021. It has also been found that organic waste is about 60% of total waste while remaining 40% is inorganic waste. There are various categories of solid waste-

1. Organic like food, vegetables, meat etc.
2. Combustible waste having high calorific value
3. Non combustible or inert waste
4. Dust or sweeping waste
5. Hazardous waste
6. Waste arising of construction

**BACKGROUND**

Municipal solid waste is considered to be most difficult to handle being mixed type of waste (Wang and Nie 2001). According to Medina (1997) an increase in income of the people may induce increased consumption of resources. Types of waste and quantity increases with increase in consumption by the populations. According to an estimate 70% of the world’s populations will inhabit the cities in near future. Burning of municipal solid waste releases PM$_{2.5}$ and PM$_{10}$ which have adverse impacts on human health. Up to 50% of the solid waste which is produced in transition economies is found lying on the roads or plots.

As reported by World Resources Institute, local administration in most of the developing countries has to allocate more than 30% of expenses on collection and disposal of solid waste. In most of the countries sanitary landfills have not been constructed. 3R approach is practiced for reduction, reusing and recycling of the waste produced during the operations. This approach is responsible for decrease of amount of solid waste which needs to be disposed in the sanitary landfills (MoE Japan, 2006).

**Table 1. composition of municipal solid waste**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Component (type of waste)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Food wastes</td>
<td>Residential, commercial and Institutional activities</td>
</tr>
<tr>
<td>2</td>
<td>Rubbish</td>
<td>Residential, commercial and Institutional activities</td>
</tr>
<tr>
<td>3</td>
<td>Ashes and residues</td>
<td>Residential, commercial and Institutional activities</td>
</tr>
<tr>
<td>4</td>
<td>Demolition and construction wastes</td>
<td>Construction and demolition activities</td>
</tr>
<tr>
<td>5</td>
<td>Special wastes</td>
<td>Residential, commercial, Institutional, municipal services</td>
</tr>
</tbody>
</table>
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