

Chapter 19

Solid Waste Management and Its Impact on the Environment

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ABSTRACT

Solid waste consists of household waste, construction and demolition debris, sanitation residue, and waste from streets. This garbage is generated mainly from residential and commercial complexes. With rising urbanization and change in lifestyle and food habits, the amount of solid waste has been increasing rapidly and its composition changing. Solid waste throws back a light on the culture that produces it and affects the health of the people and the environment surrounding it. Globally, people are discarding growing quantities of waste, and its composition is more complex than ever before, as plastic and electronic consumer products diffuse. Solid wastes are hazards as they adversely affect the living as well as nonliving components of the environment. Advanced and new methods of disposal of solid waste such as pyrolysis, pulverization, incineration, and development of sanitary landfills, etc. are used to solve the problem of managing solid waste. Dumping and burning waste is not acceptable practice from environment and health perspective.

INTRODUCTION

Human activities create waste and these wastes are handled, stored, collected and disposed of, which can pose risks to the environment and to public health (Saxena et al., 2010; Zhu et al., 2008). Economic development, urbanization and improved living standards in cities increase the complexity of generated solid waste (Gidde et al., 2008; Rathi, 2007). In discussing solid waste, generally and traditionally certain categories of wastes are well recognized as they are very common. For example, solid wastes include domestic, commercial, industrial, (due to construction and demolition), agricultural, institutional and miscellaneous. Many times domestic and commercial wastes cannot be differentiated and are considered together as urban wastes (Syed, 2006). Municipal solid waste is generally a combination of household and commercial refuse which is generated from the living community (Rajkumar et al., 2010). The continuous indiscriminate disposal of municipal solid waste is accelerating and is linked to poverty, poor

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governance, urbanization, population growth, poor standards of living, and low level of environmental awareness and inadequate management of environmental knowledge. Municipal solid waste generally includes degradable (paper, textiles, food waste, straw and yard waste), partially degradable (wood, disposable napkins and sludge) and non-degradable materials (leather, plastics, rubbers, metals, glass, ash from fuel burning like coal, briquettes or woods, dust and electronic waste). Rapid industrialization and population explosion in India has led to the migration of people from villages to cities, which generate thousands of tons of MSW daily. Poor collection and inadequate transportation are responsible for the accumulation of MSW at every nook and corner. The management of municipal solid waste is going through a critical phase, due to unavailability of suitable facilities to treat and dispose of the larger amounts of MSW generated daily in metropolitan cities. Adverse impact on all components of the environment and human health occurs due to scientific disposal of MSW (Rathi, 2006; Ray et al., 2005; Sharholy et al., 2005; Jha et al., 2003). Improper management of solid waste has been reported by several researchers in different cities of developing countries (Mohanty et al., 2014; Das and Bhattacharya, 2013; Noorjahan et al., 2012). Due to improper solid waste management, waste has become one of the pollution sources that has caused diverse environment impacts as well as detrimental towards human health and safety. India is one of the least urbanized countries of the world, yet its urban population is second largest amongst the countries of the world. Metropolitan cities (Delhi, Mumbai, Kolkata and Chennai) account for more than 42% of India's urban population (Ghosh and Kansal, 2014) and been a top producer of MSW in India due to its high occupancy.

Solid waste management is a major challenge in urban areas throughout the world. Without an effective and efficient solid waste management program, the waste generated from various human activities, both industrial and domestic, can result in health hazards and have a negative impact on the environment. Understanding the waste generated, the availability of resources, and the environmental conditions of a particular society are important to developing an appropriate waste management system. Solid waste is defined as material that no longer has any value to its original owner and is discarded. The main constituents of solid waste in urban areas are organic waste (including kitchen waste and garden trimmings), paper, glass, metals, and plastics. Ash, dust, and street sweepings can also form a significant portion of the waste. Solid waste management may be defined as the discipline associated with controlling the generation, storage, collection, transfer and transport, processing, and disposal of solid waste in a manner that is in accordance with the best principles of health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes.

Solid waste management systems cover all actions that seek to reduce the negative impacts on health, environment and economy. Developing countries are seriously facing the associated problems in collection, transportation and disposal of communal solid waste. Due to unplanned communities and developments in major cities, environmental and sanitary conditions are becoming very complex [Data collection of national study 1996]. Due to a lack of awareness and low income sources, dwellers are forced to live with unhealthy and unhygienic conditions. An improper solid waste management system may contribute to a worsening environmental degradation of the community. Illegal dumping of communal solid waste is responsible for a number of diseases.

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