INTERNATIONAL ADVANCE JOURNAL OF ENGINEERING, SCIENCE AND MANAGEMENT (IAJESM)
January-June 2023, Submitted in June 2023, iajesm2014@gmail.com, ISSN -2393-8048
Multidisciplinary Indexed/Peer Reviewed Journal. SJIF Impact Factor 2023 =6.753

Study On Solid Waste Management

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Abstract

Solid waste management practices can differ for residential and industrial producers, for urban and rural areas, and for developed and developing nations. The administration of non-hazardous waste in metropolitan areas is the job of local government authorities. On the other hand, the management of hazardous waste materials is typically the responsibility of those who generate it, as subject to local, national, and even international authorities. Around the world, waste generation rates are rising. In 2016, the worlds' cities generated 2.01 billion tons of solid waste, amounting to a footprint of 0.74 kilograms per person per day. With rapid population growth and urbanization, annual waste generation is expected to increase by 70% from 2016 levels to 3.40 billion tons in 2050.

Keywords: Solid, Waste, Management, Rural Areas

India: Solid waste management is defined as the discipline associated with control of generation, storage, collection, transport or transfer, processing and disposal of solid waste materials in a way that best addresses the range of public health, conservation, economic, aesthetic, engineering, and other environmental considerations. In its scope, solid waste management includes planning, administrative, financial, engineering, and legal functions. Solutions might include complex inter-disciplinary relations among fields such as public health, city and regional planning, political science, geography, sociology, economics, communication and conservation, demography, engineering, and material sciences.

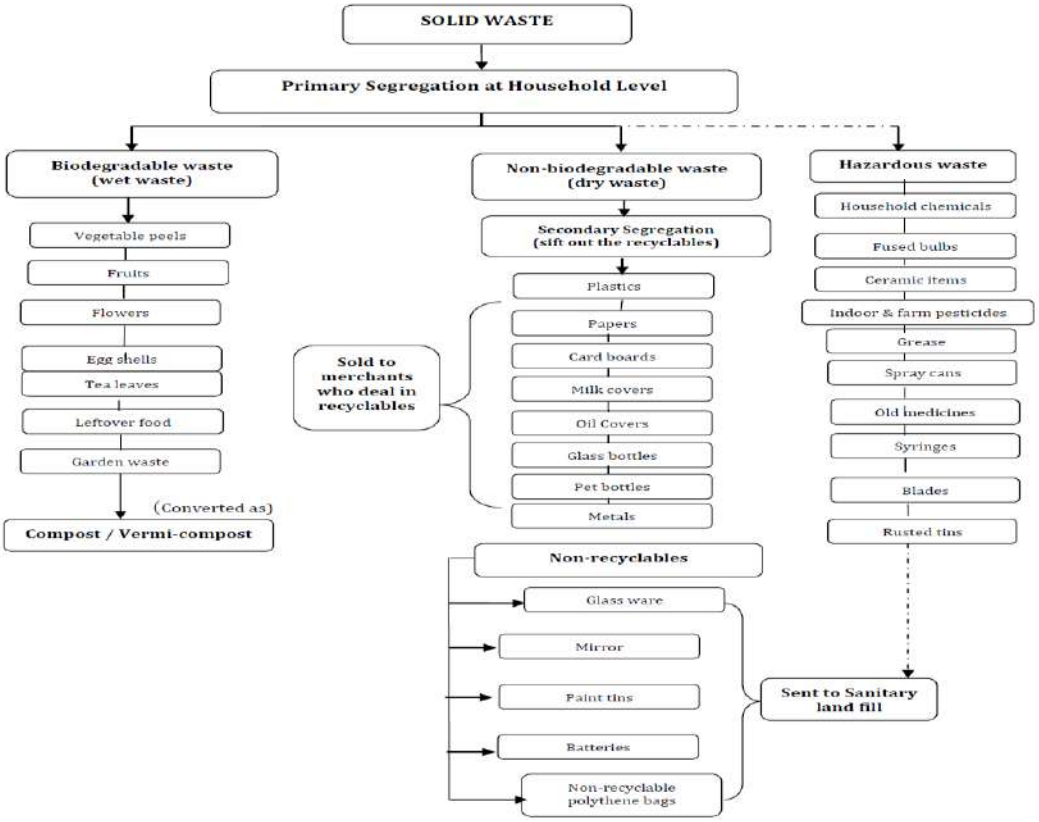

Fig. 1. A Solid Waste Management Model.

Compared to those in developed nations, residents in developing countries, especially the urban poor, are more severely impacted by unsustainably managed waste. In low-income countries, over 90% of waste is often disposed in unregulated dumps or openly burned.These practices create serious health, safety, and environmentalconsequences. Poorly managed waste serves as a breeding ground for disease vectors, contributes to global climate change through methane generation, and even promote urban violence.

Managing waste properly is essential for building sustainable and livable cities, but it remains a challenge for many developing countries and cities. Effective waste management is expensive, often comprising 20%–50% of municipal budgets. Operating this essential municipal service requires integrated systems that are efficient, sustainable, and socially supported.

Fig. 2 The process of waste handling and disposal varies in different countries.

In India, the processes differ according to the source of solid waste. They can be classified as:

- Municipal Solid Waste.
- Hazardous Solid Waste.

Municipal solid waste can further be divided into biodegradable, recyclable and hazardous domestic wastes. The biodegradable waste includes rotten food, vegetable peel and mostly wet kitchen waste. Recyclable waste includes plastic and hazardous wastes include, bulb, batteries, etc.

The industry generated like chemical factories, medical waste from hospitals are considered as Hazardous Solid Waste and needs special settings to dispose of them. In any region, solid waste management is very important for the safe disposal of wastes and to reduce environmental pollution and avoid any health hazards that it may cause. Landfills are the most common method of disposing of solid wastes. Modern-day landfills are designed by taking care of various environmental factors and types of wastes, so as to minimise pollution and health risks.

Solid waste management is one of the major problems faced by different cities all over the world. The problem is particularly due to urbanization, industrialization, poorurban planning and lack of adequate resources which contribute to the enormous amount of solid waste generation. This problem has resulted in serious environmental, social and economic complications in the developing countries like India. Population growth and dynamic economic activities in and around the city has resulted in a serious waste management crisis. Domestic, industrial and other wastes, whether they are of low or medium level wastes, they are causing environmental pollution and have become perennial problems for mankind (Ramasamy and Varghese, 2003).

The rise of mega-cities in the 1990s has also contributed to the growing problems of waste. The per capita waste generation in urban areas also varies according to the size of population. In urban areas with a population of less than 0.1 million people, the per capita waste

generated is 0.21 kg per day, while in areas with a population of more than 5 million people; it goes up to 0.5 kg per day (Askariaun et al., 2004; Baveja et al., 2000).

The urban population was 217 million in 1991 and the total quantity of solid waste generated in urban areas was estimated at 20.71 million tons per year. This is expected to cross 56 million tones 2011 (Manohar et al., 1998; Da silva et al., 2004). The quantity and nature of the waste generated vary with the activities and with the level of technological development in a country. The problem of managing solid waste is caused by poor waste collection, storage and disposal leading to subsequent pollution and environmental degradation (Ramachandra and Shruti, 2007).

The generation being the non-point/area source, collection and disposal poses a serious problem to the local municipalities and other regulatory bodies. The National and State Governments have provided an impetus to improve the solid waste management in urban areas under various programs and schemes. The Jawaharlal Nehru National Urban Renewal Mission funded 49 SWM projects in various cities during 2006 to 2009 (Ministry of Urban Development, 2014).

Solid waste management is a discipline associated with the control of generation, storage, collection, transfer, and transport, processing and disposal of solid waste in a manner that is in accordance with the best principal of public health, economi, conservation and other environmental consideration responsive of public attitude (Bhatia, 2001).

MSW involves waste generation from various sources. MSW generation rates in small towns are lower than those of metro cities, and the per capita generation rate of MSW in India ranges from 0.2 to 0.5 kg/day. The type of waste generated from different sources varies from countries to countries (Siddiqui et al., 2006).

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Rapid population growth and urbanization results in increasing environmental concerns and municipal solid waste (MSW) management is of prime importance in such rising urban issues Solid waste generation is dynamic process which depends upon the population activities of urban areas. Therefore, there is urgent need to take step for the management of the waste because it reduces its impact on environment and human health. It is for this purpose that Faridabad city is selected to map existing solid waste management system and find out the impact of solid waste on its surrounding environment (Alten et al., 2003, WHO, 2014).

Solid Waste Management in Rural Areas

The domestic waste generated in rural households of India is increasingly becoming an issue of serious concern. Though, solid waste generated in rural areas is predominantly organic and biodegradable, it is becoming a major problem as the waste generated is not segregated in-situ and is of the order of 0.3 to 0.4 million metric tons per day, as reported the Ministry of Drinking Water and Sanitation (MDWS), Government of India. Inconsiderate littering causes poor environmental sanitation resulting in unhealthy quality of living. Therefore, domestic-refuse should be handled responsibly. In order to manage waste in a desirable way, there should be a functional waste management system in place. Without a functional waste collection and disposal system at the Panchayat level it is arbitrary to hold individual households responsible, or blame them of irresponsibility.

The Government of India (GoI) as well as many State governments are looking up to Gram Panchayats to come up with a working system to manage solid waste in rural areas. We must

admit the fact that 'some' Gram Panchayats have been successful in managing solid waste, while 'many others' have had a short stint and faded away. The NIRD&PR took up the task of collecting and coming up with an array of practicable models of solid waste management, which GPs can choose from, and take up appropriately for implementation.

Strategy of Solid waste management

The World Bank finances and advises on solid waste management projects using a diverse suite of products and services, including traditional loans, results-based financing, development policy financing, and technical advisory. World Bank-financed waste management projects address the entire lifecycle of waste—from generation to collection and transportation, and finally treatment and disposal. Objectives that guide the Bank's solid waste management projects and investments include: "

- **Infrastructure:** The World Bank provides capital investments to build or upgrade waste sorting and treatment facilities, close dumps, construct or refurbish landfills, and provide bins, dumpsters, trucks, and transfer stations.
- **Legal structures and institutions**: Projects advise on sound policy measures and coordinated institutions for the municipal waste management sector.
- **Financial sustainability**: Through the design of taxes and fee structures, and long-term planning, projects help governments improve waste cost containment and recovery.
- **Citizen engagement**: Behavior change and public participation is key to a functional waste system. The World Bank supports designing incentives and awareness systems to motivate waste reduction, source-separation and reuse.
- **Social inclusion:** Resource recovery in most developing countries relies heavily on informal workers, who collect, sort, and recycle 15%–20% of generated waste. Projects address waste picker livelihoods through strategies such as integration into the formal system, as well as the provision of safe working conditions, social safety nets, child labor restrictions, and education.
- **Climate change and the environment:** Projects promote environmentally sound waste disposal. They support greenhouse gas mitigation through food loss and waste reduction, organic waste diversion, and the adoption of treatment and disposal technologies that capture biogas and landfill gas. Waste projects also support resilience by reducing waste disposal in waterways, addressing debris management, and safeguarding infrastructure against flooding.
- **Health and safety**: The World Bank's work in municipal waste management improves public health and livelihoods by reducing open burning, mitigating pest and disease vector spreading, and preventing crime and violence. "
- **Knowledge creation**: The World Bank helps governments plan and explore locally appropriate solutions through technical expertise, and data and analytics. *What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050* captures the latest trends in waste management.

The World Bank's waste management engagement spans multiple development areas, including energy, environmental sustainability, food and agriculture, health and population, social protection, transportation, urban development, and water.

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