

IMPACT OF CHANGING ENVIRONMENT: SOLID WASTE MANAGEMENT

Dr. Savita Agarwal

Assistant Professor

Department of Chemistry

Gokul Das Hindu Girls College

Moradabad

Email: dr.agsavita@gmail.com

Mrs. Shivani Gupta

Assistant Professor

Department of Physical Education

Gokul Das Hindu Girls College

Moradabad

Abstract

With increasing solid waste being one of the major issues of concern at present, the local government and municipalities need to take some more proactive steps for the management of solid waste. What is solid waste?

- *Solid waste is the waste and undesired product obtained as a result of the activities of the society. When goods or materials are discarded after use, it is either produced by the product of production processes or originated from the domestic and commercial sector. In a layman's language, solid waste is generally defined in the following terms –*
- *Garbage: A term used primarily for food waste, but may also include other degradable organic waste.*
- *Rubbish: A term used for combustible and non-combustible solid waste, excluding food waste.*
- *Refuse: A collective term for solid waste, which includes both garbage and rubbish.*
- *Litter: scattered items, paper, discarded wrapping material, bottles etc. thrown here and there in the open in public places.*

Reference to this paper should be made as follows:

**Dr. Savita Agarwal,
Mrs. Shivani Gupta**

*IMPACT OF CHANGING
ENVIRONMENT: SOLID WASTE
MANAGEMENT*

*Vol. XIII, Special Issue
pp.20-25
Article No.5*

Similarity Check: 12%

Online available at:
<http://jgv.anubooks.com>

DOI: <https://doi.org/10.31995/jgv.2022v13iS.005>

What is solid waste management? The solid elements or substances discarded by humans after use are called solid waste. It includes various types of cans, bottles, glass, polythene bags, plastic items, ash, household waste, iron-wood etc. Solid waste management includes proper collection of wastes and wastes, their collection at dumping sites and their proper disposal. Thus, solid waste management involves two processes - 1. Collection, 2. Disposal. Along with these processes, the recycling process is also sometimes used in solid waste management. Solid waste is mainly obtained from urban and industrial areas. source or cause of solid waste The major sources of solid waste materials are:

1. Industrial Waste Many types of wastes are discarded by industrial units, which are the main factors of land or soil pollution. Examples are large quantities of bagasse from sugar factories, ash produced from thermal power plants, hazardous chemicals from copper and aluminum smelting plants, waste material from fertilizer units, etc.
2. Domestic and municipal waste Garbage coming out of the houses and garbage collected in public places is a big problem for the municipal bodies. This includes polythene, plastic, paper, bottles, tins, blades, household waste etc. In developed countries, there is a serious problem of performance of old vehicles, Tyres, fridges, electronic goods etc. New York City alone generates 25,000 tons of garbage every day. In India, about 6 thousand garbage is generated every day from Mumbai metropolis. Due to the inability of municipal bodies to dispose of the entire waste, the surplus waste continues to increase.
3. Agricultural waste The stalks, leaves, weeds etc. left in the fields after harvesting are called agricultural waste. These substances lying in the fields cause problems if they are in excess. In developing countries, there is no particular problem due to the use of these wastes in many forms, but in developed countries their disposal is a serious problem.
4. Mining Waste A lot of waste is generated during the extraction of minerals. For mining, the earth's surface is first broken or excavated. This creates a pile of debris. Low grade minerals are discarded during the mining process. Mineralized debris also spreads here and there during transportation. Large piles of debris created from waste can be seen in the mining area.
5. Skeletons of other dead animals, slurry produced during cutting and polishing of building stones, waste from slaughter houses, biomedical waste from hospitals, waste from poultry farm etc. are other causes of solid waste.

Solid Waste Management

Solid waste can be managed in the following ways:

1. Regular collection is the first step in the management of solid wastes. For this, dustbins should be kept at designated places in every street and locality and garbage should be picked up regularly.
2. The collection of degradable and non-degradable waste should be done separately, so that their disposal and recycling is convenient. Rotten food, fruits, vegetables etc. come under the category of decomposable matter.
3. Any type of waste should not be immersed in the open.
4. Appropriate measures should be taken by the municipal bodies to transport all the collected garbage to the dumping site every day.
5. In the busy areas of the cities (markets, public places etc.), the collection of waste should be done multiple times per day.
6. Proper disposal or disposal of waste materials after collection is an important task. The collected waste should be sorted and classified into different categories. Degradable substances should be made edible by condensing them in pits. Combustion of combustible materials should be done. Metal waste materials and inflammable wastes should be dumped at the dumping sites made away from populated areas and water sources.
7. Incinerators should be installed by the municipal bodies for disposal of combustible wastes.

8. Strict action should be taken against the institutions and individuals who do not dispose of solid waste properly. Types of Solid Waste: Some of the major types of solid waste management are as follows:
 - (a) Municipal of solid waste (MSW); (b) Harmful waste;
 - (c) Industrial waste; (d) Agricultural waste;
 - (e) Bio medical waste; (f) Waste minimization.
- **Municipal Solid Waste (MSW):** The term municipal solid waste (MSW) is generally used to describe most of the non-harmful solid waste from a city, town or village that is routinely collected at a processing or disposal site. and require transportation. Sources of MSW include private homes, commercial establishments and institutions, and industrial facilities.
- **Harmful Wastes:** Hazardous wastes are those which can cause harm to human beings and the environment. They are as follows:
 - Toxic waste, reactive waste, corrosive waste, infectious waste
- **Industrial Wastes:** Food processing industries, metallurgical chemical and pharmaceutical unit breweries, sugar mills, paper and pulp industries, fertilizer and pesticide industries are the major ones that release toxic waste during processing, scrap materials, acids, etc.
- **Agricultural Waste:** The waste generated by agriculture includes waste from crops and animals.
- **Bio-medical Waste:** Bio-medical waste means any waste which is generated in the course of diagnosis, treatment or vaccination of humans or animals or in connection with research or in biological production or testing. What is solid waste management? Solid waste management is a term used to refer to the process of collecting and treating solid waste. It also provides solutions for recycling objects that are not garbage. Garbage or solid waste has been an issue ever since people have been living in settlements and residential areas. Waste management is concerned with the transformation of solid waste and its use as a valuable resource.

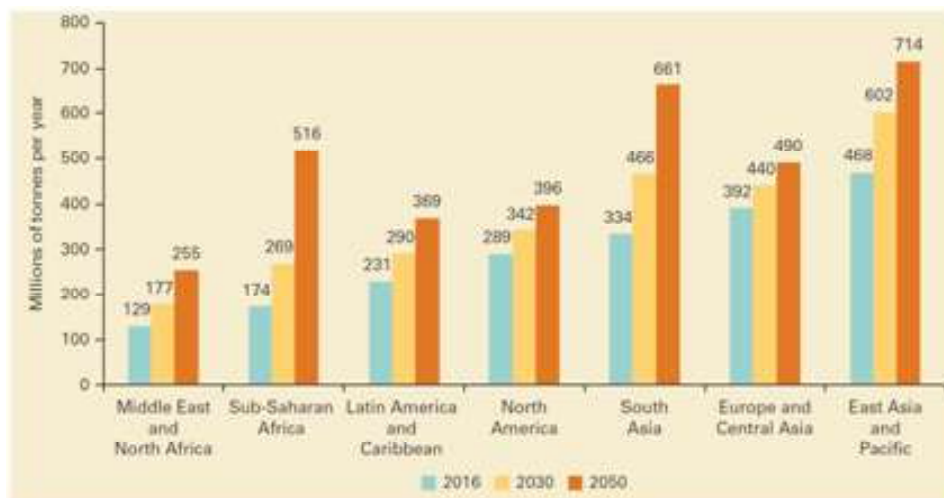
The total amount of municipal solid waste produced by India is given below – Solid Waste Management Methods:

- **Sanitary Landfill:** This is the most popular solid waste disposal method used today. The waste is basically spread out in thin layers, which are then compressed with clay or plastic foam.
- **Incineration:** In this method solid waste is burnt at high temperature till the waste turns into ash. Combustors are designed in such a way that they do not give off an excessive amount of heat when solid waste is burned.
- **Recovery and Recycling:** Recycling or retrieval of resources is the process of using abandoned but useful items for the next use. Plastic bags, tins, glasses and containers are often automatically recycled, in many situations, they have the potential to be rare items.
- **Composting:** Due to the lack of sufficient landfill space, biodegradable yard waste is allowed to decompose in a medium designed for this purpose. Only biodegradable waste materials are used in composting.
- **Pyrolysis:** It is a method of solid waste management whereby solid wastes are chemically decomposed by heat without the presence of oxygen. It usually occurs under pressure and at temperatures up to 430 °C. Solid waste is converted into gases, solid residues of carbon and ash, and small amounts of liquid.

Effects of Poor Solid Waste Management

- **Garbage in the surroundings:** Due to improper waste disposal systems, especially by municipal waste management teams, garbage can accumulate and become a hazard. While people clean their homes and places of work, they affect the environment around them, which affects the environment and the community.
- **Impact on human health:** Improper waste disposal can affect the health of the population living near a polluted area or landfill. The health of waste disposal workers and other workers associated with these landfill facilities is also at greater risk.

- **Disease Causing Pests:** This type of dumping of waste material causes the biodegradable material to rot and decompose under improper, uncontrolled conditions. Shortly after decomposition, a foul odor is produced, and it becomes a breeding ground for a variety of disease-causing insects as well as infectious organisms. Not only this, it also spoils the aesthetic value of the area.



Environmental Problems

Solid waste from industries is a source of toxic metals, hazardous wastes and chemicals. When these are emitted into the environment, solid wastes can cause biological and physicochemical problems for the environment that can affect soil productivity in that area.

- **Soil and groundwater pollution:** Toxins and chemicals can seep into the soil and pollute groundwater. During the solid waste collection process, hazardous waste is usually mixed with ordinary waste and other flammable wastes, making the disposal process even more difficult.
- **Emissions of toxic gases:** When hazardous wastes such as pesticides, hazardous lead, mercury or zinc, cleaning solvents, radioactive materials, e-waste and plastics are mixed with paper and other non-toxic scraps, they produce dioxins, Furans produce polychlorinated biphenyls and other gases.
- **Impact on land and aquatic animals:** Our carelessness towards the waste we produce affects animals as well; and they suffer the effects of pollution caused by improper disposal of waste.

Issues and Challenges of India's Waste Management System

- **Urbanization:** With rapid urbanization, the development of solid waste has increased dramatically, which has emphasized on solid waste management system.
- Most of the Indian urban local authorities fail to provide effective waste management services due to financial difficulties, lack of facilities and technology.
- **Segregation issues:** While solid waste management regulations require segregation of waste from the source itself, it has not been implemented on a large scale. Most of the waste is not recycled due to inadequate segregation of waste.
- **Waste disposal:** Most of the local authorities collect solid waste without any treatment at open dump sites. Such places emit foul odors and become grounds for disease-causing rodents and insects. The liquid generated from the waste pollutes groundwater and poses a significant health and environmental hazard. In addition, these landfill sites are also responsible for air pollution.
- **Waste Processing:** Most of the solid waste management funds are reserved for the collection and transportation of waste, resulting in very little balance for processing and resource recovery and disposal. Many waste-to-energy installations are still not operational.
- **Workforce:** The waste management sector in India is mainly made up of informal workers coming from the urban poor. Due to poor working conditions, waste collectors that aid in waste recycling are susceptible to health harm.

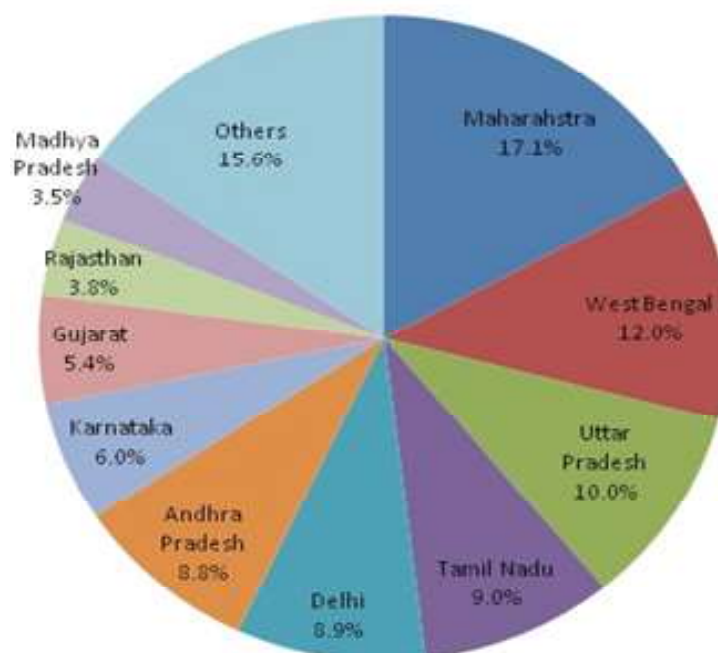
- Management apathy and low community engagement are also a major constraint on solid waste management in India. What can be done?
- The secret of effective waste management is to ensure proper waste segregation at source and ensure that the waste is passing through various recycling and resource recovery streams.
- One of the main components of SWM is wasted energy. Installation of waste-to-manure and bio-methanation plants will reduce the load on landfill sites.
- Research and development should be promoted to strengthen the method of waste management in India. Recycling and recovery from waste should be a priority and not landfilling. In addition, it is important to promote e-waste recycling so that the issue of e-waste can be addressed.
- Public-private waste management cooperation model should be promoted. Government rules and policies for SWM
- Solid Waste Management Rules, 2016: MoEFCC in April 2016 amended and notified the SWM Rules, which replaced the Municipal Solid Waste (Management and Handling) Rules, 2000. The new rules ensure responsibility extends beyond municipal jurisdiction.
- Specifies that the waste producer should segregate waste at the source and use dry waste such as paper, plastic, glass and metal for recycling and reuse, as well as wet waste from the kitchen for composting or bio methanation should also be used. The engineering specifications and criteria for the establishment and operation of landfill sites are provided in Schedule 1 of the Rules.
- In addition, Article 51A (g) of the Constitution of India gives every citizen of India a fundamental duty to protect and enhance the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living beings.

Best Practices in India at SWM

- The Kochi module depicts best practices of waste segregation at source by Kochi Municipal Corporation.
- The Panaji module explains how the vision of a city to achieve zero landfilling can be successfully converted into reality by the Corporation of Panaji City.

The Gorai module details the need for scientific completion of a dumpsite by the Municipal Corporation of Greater Mumbai. It summarizes the technical process involved, with a special focus on the perspective of the communities.

- Vijayawada Municipal Corporation has demonstrated simple and effective management of organic waste through decentralized vermicomposting facilities. This module gives details of various steps for



Vermicomposting technology – its operation, maintenance, pre and post care. It also highlights the positive consequences of vermicomposting for replication by other urban local bodies.

International Best Practices

- South Korea is one of the few countries that has a system of segregation and recycling of food waste. Landfill recovery initiatives such as the Nanjido Recovery Project have also been launched, which have successfully transformed hazardous waste sites into sustainable ecological attractions.
- It has also focused on the use of electricity from WTE (Waste to Energy) plants. In South Korea, the world's first landfill-powered hydrogen plant was installed in 2011, and currently more than 60% of new and renewable energy is generated from waste. conclusion Population growth and especially the development of megacities is making SWM a major problem in India. The current situation is that India is dependent on inadequate infrastructure, informal sector and waste dumping. Major issues in waste management are related to public participation and generally The lack of responsibility towards waste can be seen in this. There is a need to create community awareness and change the attitude of people towards waste, as it is the basic requirement for developing proper and sustainable waste management system.

References

1. What is Resource Recovery. Grand Traverse County.
2. When a waste becomes a resource for energy and new materials". www.biogreen-energy.com.
3. Solid Waste Management Article submitted in World Bank.
4. United Nations Statistics Division – Environment Statistics".
5. National Waste & Recycling Association. "History of Solid Waste Management".