



Study of Solid Waste Management and its Safe Disposal by Various Methods

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ABSTRACT

Problems related to waste generation and management are of great interest to many scientists specializing in environmental science. One of the main services provided by cities across the country to keep cities clean is waste management. The population coverage is minimal, the methods in use are antiquated, and the poor are marginalised. Living conditions are unhygienic due to the widespread littering of waste. The measures in municipal laws governing urban local authorities are insufficient to adequately address the solid waste management issue, which is always getting worse. The situation is getting worse as cities grow rapidly. In the last 60 years, the urban population has increased by a factor of five, from 377.

Keywords: Fundamental, Urban, Antiquated, Littering, Authorities.

1. Introduction

1.1 General

Non-liquid materials that no longer have any use to the person handling them are considered solid trash. When referring to solid waste, the phrases rubbish, junk, trash, or refuse are frequently used as synonyms. Domestic families, commercial and industrial businesses, health care and institutional operations, as well as public litter, all produce solid waste in metropolitan settings.

Due to the fact that all garbage producers use streets as dumping grounds, street trash is a combination of trash from many sources. Street trash often comprises a lot of human faeces and animal excrement in areas with poor sanitation services and a big number of roaming animals. Streets are frequently utilised to dispose of large amounts of construction and demolition waste.

1.2 What is Solid Waste Management

Waste management is the collection, processing and disposal of waste that is disposed of when it reaches the end of its useful life or is no longer needed. Solid waste is a non-liquid, non-toxic material such as solid waste or municipal waste that sometimes contains mixed and hazardous materials.

Improper disposal of municipal waste can lead to an unsanitary environment that damages the environment and causes the spread of diseases by rodents and insects, known as vector-borne diseases. The solid waste management task presents complex challenges. They also raise a number of administrative, financial and social issues that need to be addressed. It includes household waste, toilets, workplaces, schools, food services and shops.

1.3 Importance of Solid Waste Management

In areas with sufficient space, landfills are often the most effective way to dispose of non-recyclable waste. However, it has become difficult to find places with sufficient capacity, easy access and the right environment. However, landfills are always important for waste management. There will be residues after incineration as some wastes cannot be recycled. and other treatment methods that must be disposed of underground. Additionally, landfills can actually make bad land better. Some communities turn legally completed landfills into parks, playgrounds, or golf courses for recreation.

1.4 Need Of Solid Waste Management

However, there are problems in waste management in other parts of the world. In these areas, poor waste management continues to impact public health in cities and towns by polluting local water, air and soil, causing severe drought and ocean pollution, and making people more vulnerable to climate change.

The foundational idea of sustainable development forms the basis of waste management regulations. This will shield your home from potentially dangerous effects brought on by solid trash. Municipalities and other relevant authorities are required to take precautions to ensure that any practises they adopt do not interfere with the sustainability element. However, as more and more areas are urbanised and developed, the nation is dealing with a massive waste problem.

1.5 Classifications of Solid Waste

1. Domestic/Residential Waste
2. Municipal Waste
3. Commercial Waste
4. Institutional Waste
5. Garbage
6. Rubbish
7. Ashes
8. Bulky Wastes
9. Street Sweeping
10. Dead Animals
11. Construction and Demolition Wastes
12. Industrial Wastes
13. Hazardous Wastes
14. Sewage Wastes stream.

1.6 Methods for Solid Waste Management

1. Open Dumping: Household garbage, household garbage bags, tools, old drums, used tires and other waste materials such as wood, tiles, pipes and asbestos can be hazardous to people, animals and the environment. An open dump is an unauthorized dump site; should not interfere with the city's waste disposal or recycling facilities. If left unattended, open dumps tend to expand and can attract the dumping of waste and hazardous materials.

The following hazards to one's health, safety, and environment come from open dumps:

- An explosion and fire
- Breathing in poisonous gases, Children getting hurt while playing on or near the garbage site. Mosquitoes, flies, and rodents spreading disease.
- Pollution of lakes, rivers, and streams.

2. Landfill: A landfill is a specially designed place where waste is collected, compacted and sealed before disposal. The bottom is lined to prevent soil contamination. As a result, wastewater disposal and treatment, groundwater monitoring, degassing (for gas incineration or power generation) and capping systems are important parts used for product disposal. Environmental risk analysis is used to plan and settle capacity. Additionally, there are landfills that are specifically made to encourage anaerobic biodegradation of the organic portion of the waste to produce biogas by increasing the oxygen and moisture supply.

3. Sanitary Landfill: A wastewater with a wide range of characteristics is sanitary landfill leachate. Due to the size and age of the sanitary landfill, the amount and quality of acid can change over time, making it difficult to choose the appropriate model for the treatment plant. The leachate treatment plan can also be updated over time. Plants that are biological or physical/chemical are possibilities. Leachate treatment is also a substantial expense component of operating a landfill because it will be required over a long period of time. Numerous different considerations must be taken into account for the design and operation.

4. Composting: Organic waste is broken down into simple substances by organisms (mostly bacteria and fungi) during composting. Due to the degradation of nitrogen-containing elements, the original material is broken down into more homogeneous products that can be used as soil conditioners. Many unwanted organisms, including weeds and bacteria, are killed by the heat produced by the process. Composting has many benefits, including reducing waste, eliminating heat-killed pests, and creating useful and marketable products. Increase the organic matter in the soil by adding compost.

This improves soil quality and allows gradual release of nutrients for next year's crops.

5. Vermicomposting: If they are not managed and used properly, the development of organic or green waste (items such as food, plant, or animal wastes, such as manure), which includes these wastes, can be a challenge for agricultural businesses. Vermicomposting, often known as wormeries, is a quick and efficient way to manage organic waste while also recycling vital resources like fertilisers. In the same way that organic waste is decomposed biologically in an aerobic environment to create stabilised organic fertiliser during the typical composting process, vermicomposting uses the same process. Vermicomposting, in contrast to composting, involves both earthworms and microorganisms, which has the effect of accelerating the biodegradation of organic waste.

6. Incineration: The incineration process will incinerate the material contained in the waste. Waste to energy is a popular name for waste incinerators. The term "heat treatment" refers to waste disposal and other heat treatment operations. During incineration, waste ash turns into smoke and heat. Most waste products produce ash, which can be seen as solids or small particles carried by the gas. Gaseous and particulate pollutants must be removed from flue gases before they are released into the atmosphere. In some cases, the heat generated during combustion can be used to generate electricity. Waste incineration is one of the energy recovery technologies.7. Future Scope: Public participation should be encouraged, particularly in isolation and employment, to increase the effectiveness of SWM in India. In order to reduce waste and waste and promote reuse and recycling, the policy framework for sustainable SWM should support changing the behavior of voters, voters and policy makers. To improve the SWM system in India, a change in community awareness and people's attitudes towards waste and disposal is required.

2. Review of Literature

2.1 General

This section reviews the research and application of traditional methods for waste management. The purpose of this publication is to update previous knowledge of waste management techniques. There are many publications in the literature on solid waste management, however the following are some of the most significant ones that directly relate to the topic of the study.

2.2 Review of literature

Sudha Goel (2008) The population and standard of living of the populace are the main determinants of waste generation for any municipal organisation. The city of Akola is expanding quickly in all directions and produces a significant amount of rubbish every day, making the job of the corporation more difficult. On a daily basis, 130–135 M tonnes of waste are produced from a variety of sources, including households, industrial areas, hospitals, and schools. According to the rules established by the government, it is the responsibility of Municipal Corporation to handle and manage this trash. Additionally, the corporation makes very little effort to reduce waste rather than dumping it in an open area. Corporation, however, falls short of meeting the prerequisites. Based on a study on solid waste, this paper.

(2017) Som Dutta Banerjee Indian cities The Case of India's Private Sector Participation in Municipal Solid Waste Management The urban sector would be essential in maintaining India's economic growth pace in the ensuing decades. The Urban Local Bodies (ULBs) would have significant challenges in expanding urban infrastructure and providing amenity services at a sufficient level. The management of municipal solid waste is one of these pressing issues. The public purse would be severely burdened if the public authority was required to assume entire responsibility for this waste management. So, it is necessary to investigate the potential for private participation. Segregating wastes at the source (WaS) using the Municipal Solid Waste Management (MSWM) and Handling Rule, 2000.

Economic & Political Weekly LII, no. 17, Gopal Krishna (2018) Delhi is the third largest city in the world, the second most populated city in India and the second most populated city. India's population is projected to grow from 1.029 billion to 1.4 billion between 2001 and 2026, growing 36% in 26 years, or 3.35% per year. In Delhi, annual population growth rates between 1991 and 2011 were nearly twice as high as those nationwide. Additionally, it is a commercial hub with numerous employment opportunities, which has sped up urbanisation and increased the production of municipal solid waste (MSW). Currently, Delhi residents produce about 7000 tonnes of MSW per day, which has been projected to increase.

Satpal Singh (2015) India is the second-largest nation in the world and makes up 11% of the global population with a population of over 1.21 billion (Indian Census, 2011). According to the most recent census, which was conducted in 2011, the urban population increased by 31.16 percent between 2001 and 2011. Due to widespread migration, the population growth has altered the physical size of the cities, but it has also put a tremendous strain on the infrastructure and fundamental services available throughout Indian cities. Due to rising urbanisation, many Indian towns are grappling with the critical issue of solid waste management (SWM) and are looking for solutions that would raise the standard of living for citizens.

D. Karthykeyan et al (2012) India produces around 48 million tons of domestic solid waste every year. Today's cities are estimated to generate 46 kg of waste per person per day. This waste is two to three times more than rural waste and is growing at a rate of 1.3% annually. Estimated at 3.5%, the current urban growth rate has significant implications for garbage production. Paper and packaging waste will also increase altering waste composition as GNP and urban population grow. These modifications will put further strain on the already constrained financial resources & deficient waste management systems. Municipalities in India are in charge of handling all solid waste (SWM) in respective cities.

2.3 Summary

In view of the review completed on every one of the alluded specialized papers, holes were recognized so unbiased of our venture could be finished. Framework of undertaking was drafted and plans to make it a result-based project were settled.

3. Case Study

3.1 Case Study of Yewai Village

The most important details in this text are the steps taken to make Yewai Village a clean village. These steps include a Panchayat functionaries meeting, a Gram Sabha meeting, a community education meeting, and an area survey. The Panchayat President, Vice-President, Secretary, and additional ward members ought to publicly declare their support and commitment to advancing the cause of clean GP within a year. The Gram Sabha ought to debate the definition of a clean village and adopt a resolution. Biodegradable, nonbiodegradable, recyclable, hazardous, and primary segregation wastes should all be covered in community education. Fencing should be done to prevent future misuse. The existing arrangement for waste disposal should also be studied. The most important details in this text are the material planning, manpower planning, technical planning, financial planning, and organisational planning. Preparation of items such as bicycles or solar cells using a garbage truck, work clothes and equipment, separate areas, mixing areas, dry storage rooms, tools and equipment. Personnel planning includes 2 workers in 150 households, business planning includes handling and disposal of waste, financial planning includes two types of wages, and organizational planning includes hiring as planned.

3.2 Case Study of Thane City

Thane Municipal Corporation (TMC) organizes the three-day Thane Waste Expo to inform and promote the public about waste management technologies and products. Companies like Ecobot, Eco Support, Neem Enviro, Neel Kamal, Sanjeevani, Concept Biotech, Mantras Green Resources, Bioplastic bag, attended the event. AILSG Mumbai provides support to Thane Municipal Corporation and Kalyan-Dombivali Municipal Corporation in preparations for Swachh Survekshan 2018-19. AILSG Mumbai provided handholding support to Thane Municipal Corporation and Kalyan-Dombivali Municipal Corporation in preparation for Swachh Survekshan 2019 by placing two full time and one part time team members. AILSG Mumbai provided handholding support to Thane Municipal Corporation and Kalyan-Dombivali Municipal Corporation in preparation for Swachh Survekshan 2019 by placing one full time and one part time team member. AILSG Mumbai has appointed Thane Municipal Corporation to undertake a scientific study of municipal solid waste generation and its environmental impact assessment for the next 25 years. The scope of work includes assessment of existing scenario, estimation of scenario in next 25 years, and assessment of impact on environment. The study will be conducted in three phases: first phase, second phase, and third phase.

Municipal Products (TMC) are used to lift facilities to generate electricity. The facility will process 600 tons of wet waste per day and its capacity will increase to 800 tons by 2020. This complies with the Solid Waste Management Act 2016.

4. Research Methodology

Waste generation costs range from an average of 2 kg (4.5 lb) per person per day in the United States, Japan, Canada and some developing countries. Most communities require that household waste be stored in durable, easy-to-clean, tight-fitting lidded containers. Each vehicle with a capacity of 30 cubic meters (40 cubic yards) is serviced by a driver and one or two workers. Compression reduces the volume of garbage in the truck to less than half its loose volume.

The task of choosing the best collection method is a difficult problem for cities with large populations. Rural areas can present certain problems due to low population density which leads to high housing costs. A transfer station is a central location where waste is mixed into large vehicles such as tractor-trailer units. It provides a way to treat and recycle waste and sewage in a single project. Steps include identification and separation, size reduction, and digestion. Garbage disposal can be done through open windows or in closed systems. Outdoor composting requires a large soil area, while indoor composting systems can reduce soil requirements by up to 85%. The digestion process of manure includes drying, screening, pelleting and pelleting. Incineration is a good way to reduce the volume and weight of waste, but it is expensive to transport and competes with other fertilizers.

5. Conclusion

India's SWM system is in critical condition due to lack of funding and legal framework for waste collectors. To solve this problem, economic and financial issues should be given priority. Policy documents or plans should be prepared to facilitate distribution and public participation in isolation and treatment. Community awareness and human dynamics and disposal of waste can go a long way in improving the SWM system in India. European Commission, US Occupational Safety and Health Administration (OSHA), World Health Organization, US Centers for Disease Control and Prevention, International Solid Waste Association and OSHA, COVID-19 outbreak. MoHUA has issued several guidelines and recommendations to help ULBs in the monitoring area conduct private cleaning in public areas, properly dispose of waste from isolated homes, dispose of masks and other waste materials from isolated families, and transport them without mixing with others. other families. waste. Some states and ULBs have also created their own policies to control the spread of the virus and cover up the situation. South Delhi Municipality has turned 91 of its government meetings into ports to accommodate homeless

and displaced people. Population closures have led to significant changes in waste, including an increase in infectious and biomedical waste and a reduction in municipal waste reaching landfills or landfills.

India is the third largest waste saver country and faces significant challenges regarding waste collection, transport, treatment and disposal. Major problems include not keeping waste and doors separate, poor disposal methods, and magpie waste. Waste data in India is inconsistent as there is no system to collect data on a regular basis. The SWM Code 2016 recognizes the segregation of waste in regulated facilities, but the ULB has failed to develop systems and procedures. Studies have shown that waste collection is ineffective due to inconsistencies in the collection process. India's largest cities and towns deal with waste from landfills in low-lying areas outside the metropolis.

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