

# Waste Management and Its Effects

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**ABSTRACT:** *Effective waste management is required for environmental protection. Its mission is to provide hygienic, economical, and expense wastewater storage, collection, transporting, treatment, and disposal services without causing damage to the environment, ground, or water system. Our consumption habits and shifting socioeconomic situations have made sustainable waste management procedures difficult. Waste management is a multifaceted issue that necessitates the integration of technology, economics, sociocultural, and political activities. This paper aims to describe the most important features of waste management methods, as well as the interactions between the variables stated above. In addition, the paper includes some basic information on worldwide garbage creation, as well as an update on today's modern waste management technology. The interplay of the many components is emphasized. In this paper we discussed about the cycle of waste management and its preventions and uses. The future scope of this study is the basic understanding of management waste in an effective manner.*

**KEYWORDS:** *Disposal, Energy, Reuse, Recycling, Waste.*

## 1. INTRODUCTION

The procedures and activities Management of waste refers to the procedures that must be followed to handle garbage from the moment it is created until it is disposed of (or waste disposal). Trash collection, transportation, treatment, and destruction are all covered, as well as trash management procedures, waste-related regulations, technology, and economic systems. Disposal and management processes varies depending on whether the waste is solid, liquid, or gaseous. Industrial, biological, residential, institutional, commercial, pharmacological, and radioactive wastes are

all dealt with via waste management. In certain circumstances, garbage may be harmful to people's health (Yadav, 2015).

All through trash disposal process, there are health issues. Health problems may emerge in a variety of ways, both at home and abroad. Directly via solid waste management, and indirectly both through water, soil, and foodstuff. Human operations, such as resource development of essential minerals, create waste. Management of waste is to limit the harmful impacts of garbage on people's health, the economy, the environment, and aesthetics. Organisations (developed and developing countries), geographies (urban and rural areas), and the residential and industrial sectors all have varied approaches to waste management. Waste management is critical for the development of sustainable and liveable communities, yet many developing nations and cities struggle with it (Lagman-Bautista, 2020).

A study found that proper waste management costs thousands, amounting for 20% to 50% of budgetary allocation. Operating this important municipal duty necessitates the development of infrastructure that is both efficient and lengthy, along with socially beneficial. Municipal solid waste (MSW) is the term for the majority of trash generated by residential, agricultural, and commercial activities, and it accounts for a significant portion of waste management approaches. Methodologies for a Techno-Economic Integration mechanisms of a circular economy, efficient disposal facilities, and export and import control are all examples of waste management measures. And the most cost-effective, long-term design of manufactured goods (Moh & Abd Manaf, 2017; Shen et al., 2018).

Our garbage is building up all around us across the world, and despite the emergence of sustainability movements asking for more The amount of garbage we produce as a species is increasing year after year, despite increased responsibility at all strata of organisations. The annual waste generation is predicted to rise between 2.01 billion tons to 3.40 billion tons by 2050.

The problem's scope cannot be overstated, and it affects every part of the globe. Cities and ecosystems have always been strained by the sheer volume of garbage we

generate, from your salvage yard to Marine Litter, from either the urban jungle to the furthest reaches of the wilderness, and the issues we are facing today are likely to be bolstered tomorrow and although numbers increased and urban centres expand (Adeniran et al., 2017; Pirani & Arafat, 2014).

Furthermore, waste mismanagement is a serious problem on both a personal and a administrative level. The waste management industry is currently ambiguous, seeking to adjust to international consumerism, a system during which goods are produced on one continent, acquired and consumed on some other, and then discarded on still another. As a result, it is clear that a move toward uniform waste management techniques is not only beneficial, but also necessary.

Garbage management is a complicated problem nowadays, and operational procedures for transporting and harmful particles vary greatly city-to-city, country-to-country, continent-to-continent Attempts have been made, however, to deconstruct the problem and build a methodology that organises the many types of waste disposal into a hierarchy. This method seeks to cover the whole life cycle of a product and recover as much revenue as possible from every waste.

As a consequence, waste management is often divided into three categories, each based on the now-famous "3Rs" – Reduce, Reuse, and Recycle. Unfortunately, this notion primarily focuses on best-practice waste management systems by providing recommendations on the best methods to reuse garbage with the least amount of environmental damage. In practice, certain waste materials cannot be handled using this software, and some waste items often reach a stalemate. The sewage treatment hierarchy may be expanded to cover the following principles with these difficulties in mind (Muhammad et al., 2020; Thushari et al., 2020).

### *Prevention*

Avoiding waste should be a major priority for every company or individual at the top of the pecking order. Eliminating possible plastic waste should be a first port of call, whether it's preventing food waste at home or decreasing excessive packing while shipping client orders. The range of waste avoidance strategies available to each

person or organization is incredibly extensive, but three stages stand out in particular:

1.1. *Examine your requirements*

- It's easy to prevent overbuying and cutting down on unnecessary items if you thoroughly analyse your requirements

1.2. *Reduce the negative impact*

- When things are sourced locally, less resources are needed. Low-impact alternatives, as well as compostable or environmentally friendly items, should be explored.

1.3. *Purchase in Bulk*

- When you order things in bulk, you'll get more bang for your buck, with less packing and fewer shipments.

## 2. DISCUSSION

2.1. *Reuse*

If minimization is not possible, the next step in the control hierarchy is to reclaim both commodities and resources. Because of the vast quantities of resources that are in the creation and disposal of complicated goods, such as electrical and mechanical equipment, conservation maintenance repair of these objects, both at work and home, is a priority. However, practically any form of trash may be reused, from building ingredients in industrial to garments, furniture, and other household items (Bahçelioğlu et al., 2020).

- *Products for Repair*

One strategy to guarantee that items and materials do not wind up in landfills is to repair them.

- *Unwanted Items Can Be Sold*

The second-hand market is an excellent approach to guarantee that your belongings find a nice home and do not end up in landfills.

- *Materials Can Be Repurposed*

Wherever feasible, reuse raw materials: raw goods, from packaging to discarded clothing, always have a functional goal.

## 2.2. *Recycling*

The reutilizing business is rapidly expanding, and for items and supplies that would otherwise be discarded, a more environmentally responsible option is now available. The notion of cradle-to-cradle – as different to cradle-to-grave – is progressively being functional to items in order to guarantee that they may be recycled additional readily after usage. Cradle-to-cradle considers a product's complete lifespan, from enterprise over production and supply, to usage and ultimate reoccurrence to the proper reprocessing site (Abadi et al., 2021; Zamparas et al., 2019).

Furthermore, recycling as a waste management method upcoming trends such as the linear economy. However, many recyclable products still wind up in landfills, and among the numerous issues that this form of waste managing strategy faces, the proper collection, categorisation, and alteration of metals is possibly the greatest important. Furthermore, the advent of fewer acceptable reprocessing procedures such as sending garbage across seas for processing has prompted many to ask for improved change measures and material monitoring to assure that items submitted for recycling are indeed recycled.

## 2.3. *Recovering Energy*

Energy recovery may be a realistic option where there is no other option except to transport plastic garbage to be disposed of, depending on the metal involved. Individuals and even businesses seldom have the chance to build such waste management systems. system on their own; instead, the municipality or government is often responsible. Incineration, for example, is a process in which resources are burnt to generate energy at properly designed device plants. Furthermore, more sophisticated and less frequent processes like gasification or dig estate may convert non-recyclables into useful energy sources like syngas. However, only a tiny proportion of garbage can remain treated in this manner, and while energy recapture is better than disposal, it does emit pollutants like CO<sub>2</sub> into the environment (Jouhara et al., 2017).

#### 2.4. *Disposal*

Finally, for any item or commodity at the bottom of the trash collecting ladder, traditional landfill disposal processes are the least acceptable outcome. Apart from the growing enormous areas of land occupied by these sites and the concerns of disease transmission from rodents and insects, landfills generate massive volumes of when garbage decomposes, it produces toxic by-products. Particularly harmful substances that emit greenhouse gases include leachates, which are toxic liquids that run through debris masses, and degradation gases, such as formaldehyde.

#### 2.5. *Using the Correct Waste Management Methodologies*

The waste collection ladder is meant to serve as a guide to assist people and organizations understand exactly the waste management procedure; however, individual elements of this approach will apply to your waste management practices in the real world. As a general matter, the further you climb up the pyramid, the more power you'll have. Preventing and reusing possible waste products, for example, is a straightforward and low-cost strategy to lower your total ecological effect. However, at the bottommost of society, local, national, and even international agencies are more likely to have the last word on what happens the municipal garbage (Ahmad et al., 2020; de Oliveira Neto et al., 2019).

The recycling business, which sits halfway between these two extremes, is an outlier, requiring coordination from practically all stakeholders in the product's lifespan. Manufacturers must design and use packaging that can be readily recycled for proper recycling to occur. Customers must properly sort and arrange the materials and items once they have been used. Recycling properly in bigger enterprises and organizations requires greater planning, including the use of separate containers for different materials, proper labelling of recyclables, and precise alteration metrics to ensuring items are transported to the designated facility. Finally, independent haulers or garbage disposal operations handle the effective exchange and sharing of recyclables for delivery to recycling programs.

Recycling has enormous promise for waste reduction and lowering our ecological influence. It does, though, need a rethinking of our existing waste management

practices, which is progressively being acknowledged as a concern for countries all over the world (Guo et al., 2021).

### 2.6. *Pre-incident Waste Management Planning*

Almost every occurrence produces trash, garbage, and materials. While the quantity of garbage created varies from event to incident, it is often higher than the price of rubbish handled by many towns each year. Furthermore, homeland security disasters may produce wastewaters, such as chemical, biological, and radiologically polluted wastes, that are normally not managed by communities or sewage treatment institutions. Pre-incident planning includes reduction of waste and hazard mitigation actions aimed at lowering the overall quantity of waste created by an event, particularly in the case of a large-scale natural catastrophe, in addition to assisting the whole community in preparing for these possible wastes. While this pre-incident planning should be formalized in a Waste Management Plan (WMP), the community's preparedness yields the greatest advantages, including:

- Facilitates community adaptation to waste-related climate change consequences
- Minimizes detriment to, or otherwise influences, larger response and recovery operations owing to efficient waste management activities

### 2.7. *Best Practices and Approaches*

An audit of a company's waste management system is called a waste audit. It looks at how trash moves from manufacture to disposal. Records review, facility walk-throughs, and garbage sorting are all common methods for performing waste audits.

- The first strategy entails reviewing garbage transportation and disposal data, as well as recycling facility contracts.
- The second strategy is a team of internal auditors observing and interviewing personnel to identify waste-generating activities.
- The physical collecting, sorting, and weighed of a proportion of the organization's garbage is the third way. A day's worth of rubbish or an industrial effluent from each department may be used as a sample.

When performing a trash audit, best practices include not disclosing the auditor date to the whole business, preparing safety equipment and a sorting location ahead of time, and committing to responding on the rubbish audit results. This may be accomplished by developing appropriate corrective actions for each and every probable outcome.

If the company, for example, received a poor score in one area, the procedures below should be taken. It is critical for the company to specify the criteria before doing the waste audit in order for this to function. Another suggestion is to employ digital garbage audit checklists for easier recording and data analysis.

### 2.8. *Awareness and Education*

Education is essential for the proper implementation of various forms of waste management. Levitation consciousness of the facts nearby this vast problem is a critical component of the mystery, with the goal of improving both individual behaviours and long-standing company procedures. Training and education, from local to global, should enable us to recognize our increasing consumption and decrease the underlying with it via proper waste management. RTS assists companies in improving waste management procedures by providing LEED-accredited employee drill that promotes more environmentally friendly practices. Further, our True Consultants are available to assist organizations in achieving GBCI Zero Waste Certification. These agendas are intended to simplify the waste management procedure by letting for more efficient categorisation and transmission of waste products, hence guiding enterprises to the top of something like the sewage treatment pyramid.

Finally, via collection, confirmation, and verification, we want to establish a relationship between garbage created at the consumer level as well as waste management facilities, ensuring that specified items are always treated at the proper facility. Businesses may also analyse waste tendencies and make adjustments using intelligent diversion indicators (Habib et al., 2019).

## 3. CONCLUSION



This chapter included a wide range of waste management strategies aimed at improving human well-being and total waste management TWM practices. The factors that impact waste management technology and economics were also thoroughly explored. Different types of TWM barriers, such as economic roadblocks, political issues, legislative controversies, interesting and insightful and managerial barriers, as well as quick fixes and critical factors for implementing a proper monitoring of toxic organic waste in a global context, were also discussed using real-life examples. It was also explored how urbanization affects environmental deterioration and economic development.

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