WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

The Essence of Solid Waste Management

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ABSTRACT:

This article aims to provide the readers an overview on solid waste management. What solid waste is, its classification, the need for solid waste management, how is it done, its benefit, constraints and remedies suggested.Lot of studies have been done under this topic worldwide as the solid waste has proven to turn into great threat if not curbed in time. Ways and means have been devised through Solid waste Management to minimise thedamaged caused to the environment due to the solid waste as it is a well-known fact that it can just be minimised and can't be removed altogether. The facts in this article havebeen listed considering urban areas however it is felt the same is applicable to rural areas too.With a large number of benefits associated with Solid waste Management in many spheres like environment,health,economy and community it is quite evident that a few hindrances can be done away with a little more effort in proper planning,monitoring and implementing.

Key words: Waste, Recycle, Reuse, Benefit, Refuse, Pollution, Environment, Disease, Hazard.

Introduction:

What is solid waste?

In simple terms it can be said that solid waste is a non-liquid waste i.e., garbage or refuse arising from various activities which may be domestic, commercial, trade & industry, agriculture, construction and demolition and mining activity. Almost everything we do creates and leaves behind some kind of waste.

Solid waste however not only indicates wastes that are physically solid in nature but also includes wastes that are liquid, semi-liquid or contained gaseous material (US EPA, 2018).

Classification of solid waste

Solid wastes can be classified in many different ways:

1. Classification based on the place/source of its generation.

These includes Municipal Solid wastes from domestic sources, commercial sources, institutional sources, open areas, construction and demolition wastes.

Industrial solid wastes arising from industrial activities which includes discarded waste materials from industrial process or manufacturing operations

Agricultural wastes from agricultural activities which involves preparation, production, storage, processing and consumption of agricultural produce, livestock and their products (Issac Oluseun Adejumo, 2020).

Hazardous solid wastes from health facilities and Electronic and electrical wastes.

2. Classification based on whether it is biodegradable or non-biodegradable.

The wastes that can be broken down or decomposed into their constituents' elements by bacteria and waste from crops are called biodegradable wastes. These can be converted to valuable nutrients for agriculture and horticulture.

The solid wastes those cannot be decomposed by microbial action are called non-biodegradable solid wastes. These includes plastic containers, scrap metal, food & drink cans and plastic bags. These can be sorted out and can be reused or recycled.

3. Classification based on whether it can be burnt or not i.e., combustible and non-combustible.

The solid wastes that undergo combustion or burn are called combustible wastes. These are the organic content of solid waste. These include paper, cardboard, cartons, wood, boxes, leather, leaves etc.

The solid wastes which do not undergo combustion or burn are called non-combustible wastes. These are inorganic content of solid wastes like glass, metal, tin, cans, foils, dirt, gravel, brick, ceramics, crockery and ashes

4. Classification based on inherent dangers associated with it i.e., hazardous or non-hazardous.

Hazardous wastes are those that may contain toxic substances generated from industrial, hospital, some types of household wastes. They are either corrosive, inflammable, explosive or react when exposed. These are highly poisonous to environment (Hosam. El-Din. M. Saleh, 2016).

According to Resource Conservation and Recovery Act (RCRA), hazardous wastes are defined as any waste or combination of wastes which pose a

substantial present or potential hazard to human health or living organism because such wastes are non-degradable or persistent in nature or because they can be biologically magnified, or because they can be lethal, or because they may otherwise cause or tend to cause detrimental cumulative effects (Ichtel. J, 2014).

The need for solid waste management:

The rise in population worldwide and the migration of rural population to already crowded urban areas has led to tremendous rise in the generation of solid wastes

These wastes if not taken care of cause hazard to both environment and public health.

The garbage dumped serves a source of food for rats and other rodents which multiply quickly and spread to surrounding areas. The rodents destroy property and infect humans by their bite and spread diseases like plague, endemic typhus etc.

The presence of solid waste alone is not a cause of major health hazard but the flies, mosquito and rodents that grow/multiply because of it act as a carrier for many diseases like dysentery, dengue, Encephalitis, Malaria, Yellow fever etc.

The solid waste littered here and there makes the environment lose its beauty and become unesthetic. The leachate from the refuse dumps enters the surface and ground water source and pollute it. The soil becomes contaminated by xenobiotic industrial wastes like pesticides and aerosols etc. The burning of garbage in open area causes air pollution. The airborne pollutants and poisonous gases from garbage dumps lead to increase in pulmonary diseases in populations residing near these dump sites (Ogbonna. N. D., et al., 2002). Land, air water all are vulnerable to pollution caused by solid wastes.

Therefore, to curb, tackle and minimise all the above problems solid waste management has become a priority worldwide. It has topped the list of environmental agenda and the activities and concern for it by both citizens and government has become a prime concern (Skinner. John. H., 1993).

Its main aim is to reduce and eliminate adverse impacts of waste material on human health and the environment so as to support economic development and superior quality of life in the most efficient manner keeping the cost low and avoiding waste build-up (www. the balancesmb.com).

Solid waste Management-how is it done?

Solid waste management is taken up for the control of waste generation, its correct storage, collection and transfer including processing it and finally its disposal in the best possible way for safeguarding public health and the environment.

The activities involved are:

- Waste generation.
  It is the process carried out at home level in which the items or things which are no longer useful and are of no value are thrown away or accumulated for disposal.
- On-site handling, storage & processing.
  In the onsite handling process, the waste is collected, it refers to activities before putting the wastes in containers.
  Onsite storage, it refers to the process of waste collection before putting it into the containers.
  Onsite processing, in this process the recoverable and reusable materials are sorted out manually. It helps in reducing the volume of solid waste. Compaction and incineration is done.
- Collection.
  This is an important part of Solid Waste Management. Type of collection services, type of collection system, analysis of collection system and collection routes are the few parameters that have to be taken into consideration for proper planning & implementation of a solid waste collection system.
- Transfer & transport.
  In this process the waste or refuse is transferred into larger vehicles for haulage and thereafter transported to distant location.
- Processing & recovery.
  In this process partial solid waste disposal and reclamation is done. It reduces the volume of solid waste to be disposed.
- Final disposal.
  It is the final activity related to the final disposal of solid wastes which have been collected and hauled directly to landfill sites, wastes from water treatment plants and from other solid waste processing plants which are no longer of any use whatsoever.

Benefits of Solid waste Management:

The benefits of solid waste management can be categorised broadly into four groups:

- ❖ Benefit to Environment.
  - Reuse of materials reduces environmental pollution and thus keeps air, land and water clean.
  - Reuse reduces emission of greenhouse gas which is a factor contributing to global warming.
  - Reuse lessens the need for new material resources like wood, petroleum, fibres etc.
  - Recycling helps conserve our natural resources as it aids in reducing the need for raw material.
  - Recycling reduces dependency on landfills and incinerators.
- ❖ Benefit to health
  - Recycling protects our health when harmful substances are taken out of the waste stream.
  - Disease spreading vectors like flies, rats, cats etc are reduced.
  - Hygiene of public improves.

- ❖ Benefit to Economy
  - When materials are reused instead of manufacturing new products from raw materials, burden on economy lessens.
  - Employment is generated.
  - Manure is produced which helps in increasing agricultural production.
- ❖ Benefit to Community
  - Disadvantaged people benefit through reuse as they get the food, clothing, building materials, medicinal supplies etc which they are severely in need of (Jumba. Michael, 2014).

Constraints of Solid Waste Management:

- Inadequate training of personnel.
- Disinterested staff involved.
- Lack of awareness among public.
- Lack of monitoring by the concerned authority.
- Huge quantity of waste generation.
- Lack of proper disposal sites and know-how of disposal methodologies.
- Odd time scheduled for waste collection
- The process is not always cost effective.
- The end product has a very short life.
- The sites are often dangerous.
- The practices are not done uniformly.
- Inadequate financial support (www.content.wisestep.com)

Remedies suggested for effective Solid waste management:

- Awareness to the public for proper source segregation of waste.
- Strict monitoring and laws to be enforced for ensuring proper source segregation of wastes.
- Waste reduction through reuse and recycle to be encouraged more.
- Free distribution of garbage segregation containers to all households.
- Punctuality in local waste collection timing.
- Younger generation could be made aware regarding solid waste management by incorporating it in the school syllabus.

Conclusion

Though the awareness in solid waste management has grown tremendously in the past few years yet a lot needs to done to make it full proof. The remedial suggestions presented here may help the system improve to a great extent.

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