

Approaches for Recycling and Managing Waste

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Abstract

Abstract: With increase in population number and urbanization, trash amount is also gathering at a great pace. Increase in technology, industries, and solid trash from municipals generate large amount of trash/ wastes. Though all sorts of trash are hazardous, waste from urban areas also addressed as "solid waste" is a trash that can be controlled without creating any pollution or damage to different species. This paper includes a thorough overview of the approaches for recycling and managing waste along with the researches performed on adverse effect of trashes on environment.

Keywords: pollution, solid waste, waste compost

I. INTRODUCTION

Management of trash is a matter of immense importance. "Solid waste" is generated due to many factors such as human actions, lifestyle patterns etc. Waste control is a matter of concern not only for reducing pollution and diseases but also for recovering valuable resources from the same. Waste management may include liquid, solid, gases or radionuclidesubstances, that are managed by various prospects and expertise[1]. Usually, every waste management involves a common procedure i.e. assembling waste, carting, initial treatment, organizing and finally reducing or lessening residues. Different types of trashes are collected in different way.

Practising managing waste is different for different nations such as cities and village areas. Similarly resident and industries also practice different management protocols[2]. In residents and institutions trash is managed by local government. Similarly in commercial & production units trash is managed by one who produces it.

Recycling & regulation of trash is been practiced mostly all over the world thereby managing waste both in surroundings and households[3]. Modern system of managing waste have considered recycling practice as an important parameter in managing waste thereby cleaning the surrounding by separating the trash materials.

The major objectives of trash management involves[4]:

1. Reducing aggregate trash by recycling of declined.
2. Re-introducing certain groups of materials as raw materials at secondary level or as carriers.
3. Re-introducing natural trash into biological cycle.
4. Reducing waste disposed on lanfillsupto to best level.
5. Development of naïve technologies to manage waste upto desired level.

Apart from this following waste hierarchy, i.e. "3Rs" – "reduce, reuse & recycle" so as to

properly manage trash and provide a clean & green environment[5].

II. METHODS OF TRASH MANAGEMENT PRACTICE

Categorization & allocation of discrete trashes to respective classes is not so easy by using traditional methods. Some naive methodology and techniques are needed to be proposed and manufactured by researchers. Table 1 shows methods of trash management procedures[6].

Table 1: Trash management procedures

Waste stream	Waste disposal methods
Combustible wastes	Roaster incineration Fluid bed incineration Pyrolysis-incineration Pyrolysis-gasification Separation-composting-incineration (Wet and dry) separation-digesting-incineration Separation-digesting-pyrolysis Separation-digesting-gasification Separation-digesting-incineration in a cement plant Selective separation-incineration
Non-combustible wastes	Landfill
	Pyrolysis and co-incineration in a coal power plant Pyrolysis and co-incineration in a powdered coal power plant Incineration in a fluid bed furnace Gasification
Partially combustible waste streams	Plastics Wood
	Gasification Feedstock Recycling
	Organic wastes Composting Anaerobic Digestion

III. HIERIARCHY OF TRASH MANAGEMENT

The major concept of managing the trash is reducing the trash and then reusing it. By reducing the aggregate trash generated, a reduction in source trash may be achieved which will further can be reused thereby preventing them from entering main waste stream. The trash is collected once it gets generate. Recovering any material for trashes in the course of recycling followed by composting is considered to be convenient way of managing wastes. Due to improper facilities such as technology & economic problems of recycling, designing of product and inadequate trash separation sources, most of solid trashes are compost into landfills.

IV. SUBSTANCES RECOVERY FROM TRASH

Recycling

From generations reduce & reuse of trashes has been the most convenient methods of managing trashes. Recycling requires different lines of waste collection. Just because of limitations in differentiating sources, trash gets collected in mixed way that is addressed as “municipal solid waste (MSW)”[7].Separation of mixed trash is very difficult. Usually manual separation is done which includes paper, glass, metals and plastics as these materials are recyclable. It is very hectic and time consuming to segregate such substances from solid trash and moreover sometimes it is not done properly thereby, problems arises in recycling and decomposing such waste. But these trashes are required to be combusted so as to prevent landfilling and at the same time generate energy.

Organic Composting

Organic composting is as important as inorganic trashes recycling. The compost of organic material obtained may be used for “organic 4066 Trends in Biosciences 10 (21), 2017 fertilizer” for farming.

These organic compost can be used as macro nutrients rich in N, P, and K. Apart from this, these can also serve as important micro-nutrients[8].

The compost generated from aerobic trashcomposting is already contaminated mainly by heavy metals. This type of contamination can be hazardous to health of public and surroundings which also restricts farming. Therefore, mixed trash composting is not a suitable method for sustainable trash management. India is usually preferred country for composting mixed trash comprising organic & inorganic substances as 93% of municipal solid trash is landfilled without any kind of alternative. Figure 2 is a pictorial representation of organic composting.

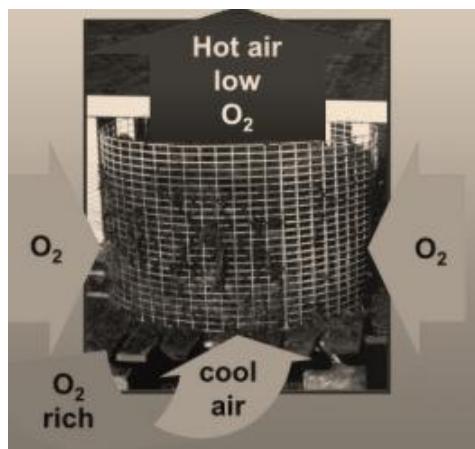


Figure 2: Organic composting



Figure 3: Anaerobic digester

Landfilling

“United Nations Environmental Program (UNEP)” addresses landfilling as manageable disposal of trashes on land in a suitable way so that the contact b/w trashes & surroundings is reduced in a significant way thereby, concentrating trashes in predefined space/ area[10]. Landfill is developed to extract trashes from the natural surroundings and leaving them innocuous via “biological”, “chemical” & “physical” processes.

A/c to researchers, the last option in hierarchy of trash management is landfilling. Of all the sanitary landfilling is the most commonly practiced solid trash management. Since, for landfilling there is a scarcity of area and moreover it also leads to increase in costs therefore, trash utilization is a potent alternative in contrast to disposal. Figure 4 is a pictorial representation of landfill.

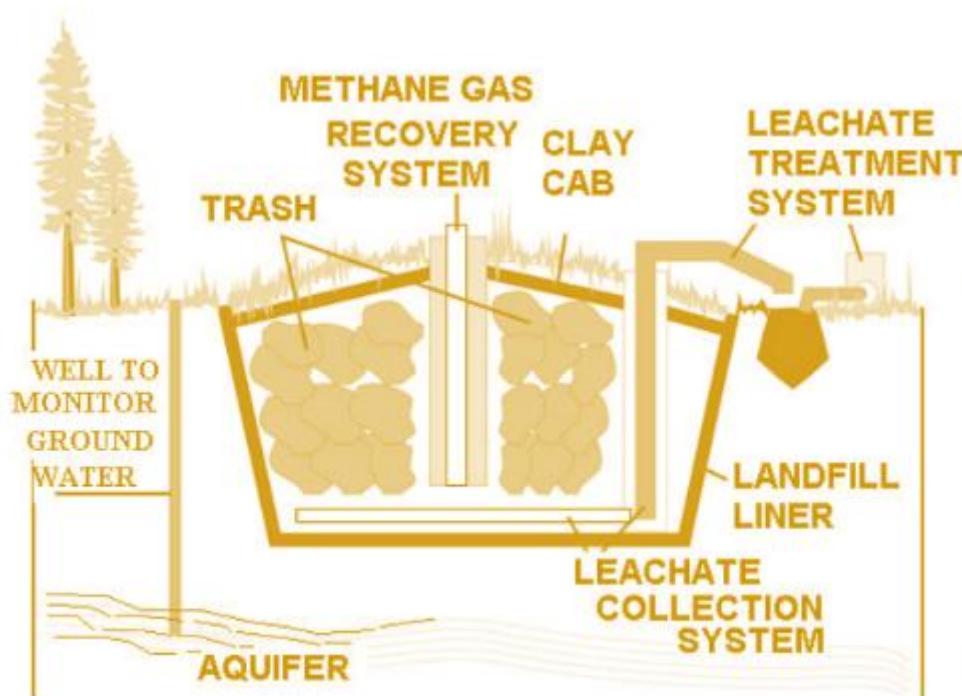


Figure 4: Landfill

V. PROBLEMS TO PUBLIC

The present level of solid trash management in metropolitan areas is very threatening to health of society. The smoke & bio-aerosols generated due to burning of trash are inhaled by people which may lead to severe health problems. Also, the release of air-borne insects can also lead to certain infections[11]. Toxic materials within trashes are the major cause of respiratory & skin problems, irritation within eyes and reduced life span. The percentage of carbon and hazardous elements like lead, chromium etc. leads to life

threatening diseases upon consumption with water.

Compost from composting of trash is usually infected with heavy metals such as zinc, copper, lead, nickel etc. Therefore, by utilizing such composts for farming on field can contaminate the field soil with contaminated heavy metals.

Also, the street animals, insects and pests also eat wastes and spread diseases to public. The mosquitoes too breed upon sewers and drainage systems that are clogged by trashes.

CONCLUSION

This paper conclude that, trash management is a matter of concern to prevent the public health from hazardous diseases and creating a clean & green environment.

REFERENCES

- [1] A. Demirbas, "Waste management, waste resource facilities and waste conversion processes," *Energy Convers. Manag.*, 2011.
- [2] R. Yadav, "Solid waste management," *Pollut. Res.*, 2015.
- [3] A. Mohajerani, J. Vajna, T. H. H. Cheung, H. Kurmus, A. Arulrajah, and S. Horpibulsuk, "Practical recycling applications of crushed waste glass in construction materials: A review," *Construction and Building Materials*. 2017.
- [4] M. Hyman, B. Turner, and A. Carpintero, *Guidelines for National Waste Management Strategies: Moving from Challenges to Opportunities*. 2013.
- [5] ECJ, "Reduce, Reuse, Recycle, Dispose," *European Cleaning Journal*, 2012.
- [6] A. Kelessidis and A. S. Stasinakis, "Comparative study of the methods used for treatment and final disposal of sewage sludge in European countries," *Waste Manag.*, 2012.
- [7] K. Ragaert, L. Delva, and K. Van Geem, "Mechanical and chemical recycling of solid plastic waste," *Waste Management*. 2017.
- [8] J. Morris, H. Scott Matthews, and C. Morawski, "Review and meta-analysis of 82 studies on end-of-life management methods for source separated organics," *Waste Manag.*, 2013.
- [9] C. Mao, Y. Feng, X. Wang, and G. Ren, "Review on research achievements of biogas from anaerobic digestion," *Renewable and Sustainable Energy Reviews*. 2015.
- [10] B. Assamoi and Y. Lawryshyn, "The environmental comparison of landfilling vs. incineration of MSW accounting for waste diversion," *Waste Manag.*, 2012.
- [11] D. N. Perkins, M. N. Brune Drisse, T. Nxele, and P. D. Sly, "E-waste: A global hazard," *Annals of Global Health*. 2014.