



Solid Waste Management

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ABSTRACT

Management of solid waste is a major challenge now a days because of industrialization, population and urbanization so that the rate of solid waste increases. Waste generation creates a problem to environment as well as public health. To minimize this problems proper collection, storage and disposal are important. This paper is review of waste management, it's element and disposal method of waste. Reduce, reuse, recycle this three principal helps for the waste management.

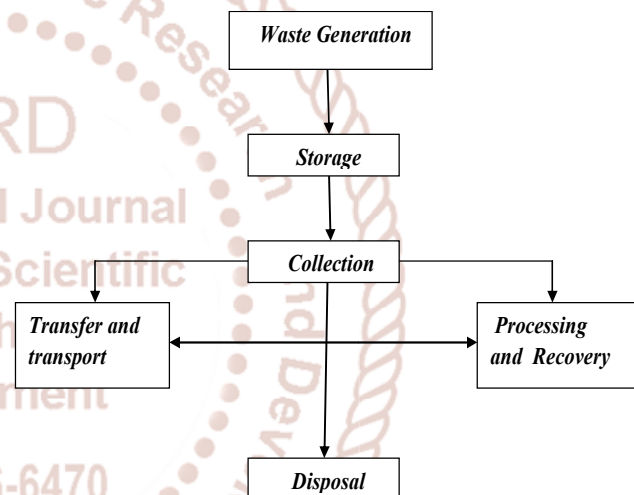
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INTRODUCTION

Solid waste are all the wastes arising from human and animal activities that are normally solid and that are discarded as useless or unwanted. Solid waste is a material that is not useful and does not represent economic value to its owner. Now a day's population is increasing, generation rate of waste is increasing. Human activities create waste and the ways that waste is handled, stored, collected, and disposal are to be risk to the environment and public health. Solid waste is mainly generated from houses, commercial, industrial, and hospital etc. It is an unwanted material left from the different process. Solid waste comprises of plastic, paper, glass, rags, food items and vegetable etc. It is continuously rising because of urbanization, income growth and changing life style and food habits.

Solid waste management from generation to disposal can be grouped into six functional elements such as

Waste generation, Storage, Collection, Transfer and transport, Processing and recovery, Disposal.



Figur A)flowchart of funtional element in solid waset management

Waste generation:-

The quantity and characteristics of solid waste varying from place to place. factors that affect the generation of waste are population, social behavior, climate, industrial production, changing life style and the market for waste materials.

Storage:-

The handing, processing of solid waste at sources before there collected is the second of the six functional elements in solid waste management system. The factors that must be considered in the onsite storage of solid waste includes

1. Type of container to be used.
2. The container location.
3. Public health and aesthetics.
4. Collection methods to be used.

Collection

The waste are separated and collected at one place and after that they are transported for the further process.

Transfer and Transport

Those activities are carried out as Transfer of waste from the smaller collection vehicle to the larger transport equipment and the subsequent transport of waste, usually over long distance, to the disposal site. Transfer and transport operation become a necessity when haul distances to available disposal site or processing center increase to the point that direct hauling is no longer economical feasible.

Processing and Recovery:-

Those techniques, equipments and facilities passed for both to improve the capacity of the other functional element and to recover usable material, conversion products, or energy from solid waste.

Disposal:-

Disposal on or in the earth mantle is, at present, the only viable method is land filling. Land filling is method of disposal used most commonly for municipal waste; land filling and deep-well injection have been used for industrial waste. Although incineration is often considered a disposal method, it is, in reality, a processing method.

There is various method of disposal as follow:

OPEN DUMPING

It is an uncovered area where people use to through their waste without taking any care of environment is known as an open dump. This method is less expensive and skilled labors are not required. This method has also disadvantages of health hazard, ground water pollution.

OCEAN DUMPING

All the waste material generated from factories and industries, radioactive waste are disposed into the ocean or sea. This is very costly process and not environment friendly and also effect on aquatic life.

INCINERATION

This method involves burning of solid wastes at high temperatures until the wastes turned into ashes. It is made in such a way that they do not give off extreme amounts of heat when burning solid wastes. It reduces the volume of waste up to 20 original volumes. Or 30% of original volume.

VERMICOMPOSTING

A wide range of organic residues, such as straw, husk, leaves; stalks, weeds, etc can be converted into vermin compost. Other potential feedstock for vermin compost production are livestock wastes , poultry litter, dairy wastes, food processing waste, organic fraction of MSW , digest from biogas plants etc. Earthworms demolish organic wastes and reduce the volume by 40-60%. Each earthworm weight about 0.5-0.6 gm, eats waste equivalent to its body weight and produces cast equivalent to about 50% of waste it consume in daily. The moisture content of casting ranges between 32 and 66% and pH range is around 7.

BIOMETHANATION

Biomethanation is process by which organic material is microbiologically converted under anaerobic condition to biogas. The solid waste from agro based industries have high organic content and hence its treatment by the process of biomethanation is most practicable as it produces useful product like biogas and enriched manure. This process consisting of two stages acidification and meth nation. It has strong potential for the production of energy for organic residue and wastes. It will help to reduce the fossil fuels and thus reduce Co2 emission.

PYROLYSIS

Pyrolysis is a thermo chemical conversion process where a solid fuel is heated in absence of an oxidizing agent. Pyrolysis as a conversion process, yields 3 products gas mixture, liquid, a solid residue. Two techniques exist and differ on method on its transfer: fast pyrolysis is production of bio oil and slow pyrolysis is production of charcoal.

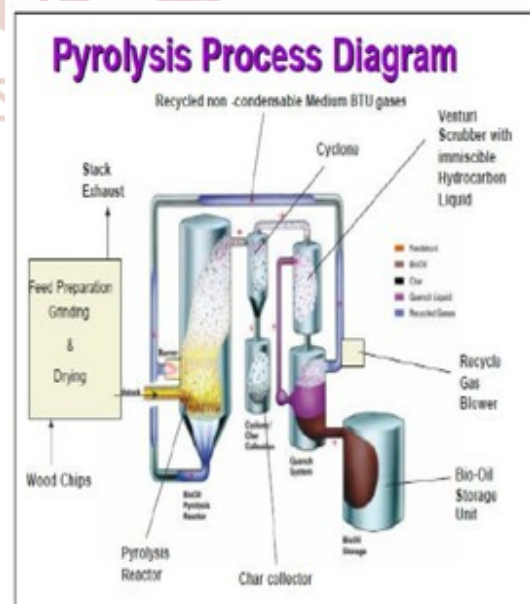


Figure B) Pyrolysis Process Diagram

SANITARY LANDFILL

The purpose of landfill is to dispose the garbage in such a way that it will be isolated from ground, will be keep dry as it is not in direct contact with air or moisture . The main aim of this process is to keep away all the garbage from the people but does not allow it to decompose quickly. Sanitary Landfill is one of its types. Sanitary landfills are sites where the waste is isolated from the environment until it is safe. The waste is considered safe when the degradation is complete in physical, chemical and biological terms. In high-income countries, the level isolation achieved may be high but it is not necessary to spend so much money on technicalities in order to protect people from diseases. Four factors should be considered before selecting a site for a sanitary landfill

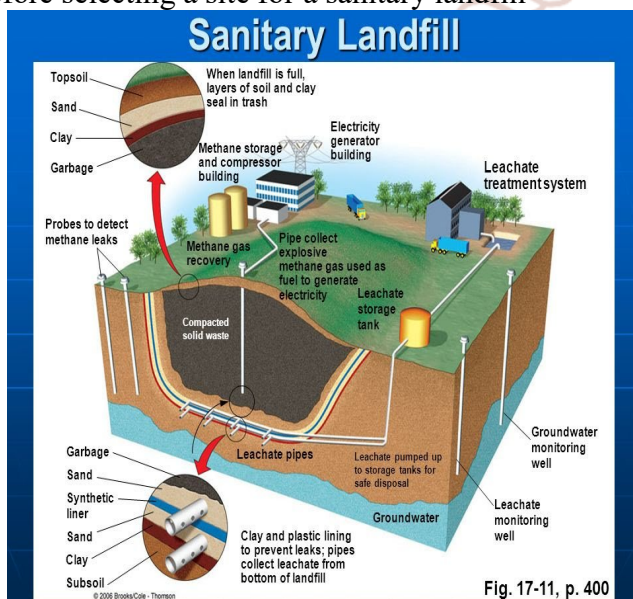


Figure C) Sanitary Landfill

LITERATURE REVIEW

Mr. Kadam and Mr. S. s. sarawade (March 2016) studied and analyzed of Solid waste management challenges and options for treatment (Indian Villages). The paper focused on the disposal of SOLID WASTE in Indian villages. SW increases due to agricultural waste, domestic waste. Depending on physical state of waste it is categories in to Municipal Waste, hazardous waste, medical waste, radioactive waste. Basically VSW is divided into four types dry waste, weight waste, raw waste, medical waste, VSW consist of organic and inorganic waste. Technical option available for processing they are based on either bio conversion or thermal conversion. paper focused on various option for treatment of village solid waste such as recycling, aerobic, anaerobic composting is the traditional method.

Mr. Krishna Kumar Yadav, Mr. Vinit Kumar (April 2016). This paper focused on the 'A review on current status of municipal solid waste management in India' Municipal Solid Waste is combination of households and commercial waste which is generated from living authorities. Solid waste which is generated in Indian cities has to be increased 6 million tons in 1947 to 48 million tons in 1997 and to 90 million tons in 2009 and it is expected to increase 300 million tons by 2047. The relative percentage of organic waste in municipal solid waste is increases with decreasing the socio – economic status, therefore rural household generate the more organic waste than urban households. This paper studies the general characteristics of Indian mega cities and their solid waste management (Chennai, Delhi ,Kolkata , Mumbai) and also discuss the flow chart of MSW management process. Study the treatment and disposal of municipal solid waste management, only 6% - 7% of the MSW is converted into compost in India rest of the waste is disposed of by land filling. New disposal technique are studied Bio-meth nation and Pyrolysis. At Luck now in December 2003 MSW power project is conducted based on the high – rate biomethanation technology. The plant is designed for 500- 600 tons of MSW every day from luck now city.

Mr. Parag S. Dawane and Prof. Sagar M. Gawande (2015) studied and analyzed Solid waste management – A Review. according to his study generation of waste increasing with increasing population , industrialization and urbanization etc. Due to rise in solid waste health problem can also be rise in day by day. In Indian cities like Delhi and Mumbai are generating more than 5000 MT of waste per day .This waste is creating a problem to public health.

Mr. G. S. Jadhav, K. R. Takale , N. R. Kokane (April 2015) Studied and analyzed 'Present status of SWM in Bor, Pune, India : Practices and Challenges'. This paper gives an overview of current SWM practices in Bor town, sub urban area Maharashtra, India and suggest solution on some of the major problems. Approximately 5.96 tons/day of solid waste are generated in municipal council area. The recommended system with maximizing recycling and minimizing land filling of municipal solid waste. The vermi composting or energy recovery become as a suitable alternative as final treatment process to the organic fraction. The objective is to analyze some of the strengths and deficiencies in the current MSW management system in Bor and propose feasible solution.

CONCLUSION

As the waste increases with population so that plan of waste management is based on the population forecasting. Because of not proper collection of waste so many health problems are arises so, to create people awareness is important. Proper collection, storage and disposal of waste minimize the impact of waste and improve the quality of life.

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