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Review Article

Review on Solid Waste Management with Emphasis on Hazardous Waste

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ABSTRACT

The solid waste disposal is generally done by using sanitary land fill method. In developing countries open dumping is done. Open dumping is dangerous option due to odour and disperson of waste in the form of particles in the air. Sanitary landfill is relatively safer option. The solid waste buried in the land contaminates groundwater. The bio composting of the waste provides additional benefits like manure for agriculture and reduction in the volume of waste. The other option of treating solid waste is incineration. Incineration has disadvantage of exhaust gases. The hazardous waste poses an inherent danger to personnel or the environment when exposed. Many investigators have carried out research for treatment of hazardous waste treatment. The current review summarizes research and studies on solid wastes with emphasis on hazardous waste.

Key words: *Incineration, composting, landfill, Deviation, anaerobic treatment, vermicomposting.*

INTRODUCTION

Solid waste management is catching importance due to stringent environmental norms and awareness. The solid waste from the domestic activities is biodegradable. It is normally classified as putrescible and non-putrescible. The solid waste disposal is generally done by using sanitary land fill method. In developing countries open dumping is done. Open dumping is dangerous option due to odor and dispersion of waste in the form of particles in the air. Sanitary landfill is relatively safer option. The solid waste buried in the land contaminates groundwater.

The bio composting and anaerobic treatment of the waste provides additional benefits like manure for agriculture and reduction in the volume of waste. [1-5] The other option of treating solid waste is incineration. Incineration has disadvantage of exhaust gases. The other methods like aerobic treatment, aeration and advanced oxidation methods can be used for the solid waste treatment. [6-8] Production of methane is added benefit of anaerobic methods. Biogas production helps to reduce requirement of non-renewable energy resources. [9-12] Other types of solid waste include medical waste, nuclear waste, pharmaceutical waste and waste from other industrial waste. Aerobic treatment needs more space and waste sludge. The disposal of this sludge is again is a problem. The waste from these industries is classified as hazardous waste. The hazardous waste poses an inherent danger to personnel or the environment when exposed. Many investigators have carried out research for treatment of hazardous waste treatment. The current review summarizes research and studies on solid wastes with emphasis on hazardous waste.

REVIEW ON SOLID WASTE MANAGEMENT WITH EMPHASIS ON HAZARDOUS WASTE

Soniya discussed hazardous waste treatment for Opium Marc. [13] It is the solid waste left after filtration of opium broth through filter aid. It falls under the category of hazardous waste. According to them, co-processing is more preferred option in the waste management system. In incineration the waste is reduced by 95-96%.Thereis need for land filling but it reduce the amount to be thrown in it. According to author, hazardous waste must be treated differently than solid waste before it reaches a landfill. Mane discussed legal profile and policies available on solid waste management in India. [14] According to him, environmentally sound and sustainable ways of dealing with waste generation, calls for stricter laws. He emphasized the need to generate sufficient funds at initial stage for the treatment of wastes. Also according to him, the concept of generation of wealth from waste can reduce economical burden on the society.

Nwachukwu et.al discussed healthcare waste management. [15] They emphasized the need for effective environmental regulatory surveillance. They discussed classification of hazardous waste. According to them, some health care facilities such as medical and Environmental laboratories are small projects and may not require full blown EIA. They also emphasized the need for the agencies to develop a module of monitoring their waste disposal. Amador carried out work based on affordable waste management approach. [16] According to him, recycling and incineration are two of the most sustainable waste management techniques available. He proposed strategic planning methodology to reduce costs and increase compliance. Ololade et.al carried out investigation on effects of household wastes on surface and underground waters. [17] They analyzed the water for some physicochemical parameters and some heavy metals. Their results indicated that wells without rings are more vulnerable to contaminants than those with rings. Earle discussed rotary kiln incineration of hazardous wastes. [18] They discussed methods of treating and destroying hazardous wastes in a cost-effective and environmentally sound way. They carried out experimentation to investigate parameters and variables affecting the design and operation of the kiln substantiate mathematical treatment of material and energy balances.

Lau carried out case study on the management of waste materials in Malaysia. [19] According to him, the major problems in solid waste treatment are low collection coverage on average due to the inaccessibility by vehicles of some areas, irregular collection services, inadequate equipment used for waste collection. There are many agencies working on environment and sanitation. According to them, proper coordination among the agencies is needed for effect implementation of solid management program. Lichtberger investigated waste generation, waste composition, and waste disposal practices. [20] They carried out case study of waste in Sagarmatha National Park and Buffer Zone (SNPBZ) in the Himalayas. They carried out material flow analysis (MFA) to detected pathways of HW within the SNPBZ. The purpose of this study was to determine negative impacts caused by contamination through inappropriate HW-management. The HW was observed to 1% of total wastes generated in the SNPBZ. They found that at dumpsite HW increases to 6% of wastes disposed.

According to Adamcovaet.al.70% of municipal solid waste is disposed of in landfills. [21] They addressed problem of hazardous waste in the context of municipal solid waste generated in a typical urban scenario. According to them, the formulation of waste is a major problem with daily household products. According to Tadesse inappropriate and inadequate solid waste disposal can cause public health problem. [22] He defined the various categories of solid wastes. He discussed classifications, generation rate and composition of solid waste.

CONCLUSION

The solid waste from the domestic activities is biodegradable. It is normally classified as putrescible and non-putrescible. The solid waste disposal is generally done by using sanitary land fill method. In developing countries open dumping is done. Open dumping is dangerous option due to odour and disperson of waste in the form of particles in the air. Sanitary landfill is relatively safer option.

The solid waste buried in the land contaminates groundwater. The bio composting of the waste provides additional benefits like manure for agriculture and reduction in the volume of waste. The other option of treating solid waste is incineration. Incineration has disadvantage of exhaust gases. The other methods like vermicomposting and anaerobic treatment can be used for the solid waste treatment. The investigations by many investigators reveal that co-processing is more preferred option in the waste management system. In incineration the waste is reduced by 95-96%.Also the concept of generation of wealth from waste can reduce economical burden on the society. Recycling and incineration are two of the most sustainable waste management techniques available.

REFERENCES

1. Shreeshivadasan Chelliapan and Paul J. Sallis, "Application of Anaerobic Biotechnology for Pharmaceutical Wastewater Treatment", the IIOAB Journal, Special Issue on Environmental Management for Sustainable Development, 2011, 2(1), 13-21.
2. Hampannavar, U.S., Shivayogimath, C.B., "Anaerobic Treatment of Sugar Industry Wastewater by Up flow Anaerobic Sludge Blanket Reactor at Ambient Temperature", International Journal of Environmental Sciences, 2010, 1(4), 631-640.
3. P.Tamilchelvan, M. Dhinakaran, "Anaerobic Digestion Treatment of Tannery Waste Water", International Journal of Engineering Research and Applications", 2012, 2(3), 932-936.
4. Britton, F.A. Koch, D.S. Mavinic, A. Adnan, W.K. Oldham, And B. Udala, "Pilot-Scale Struvite Recovery from Anaerobic Digester Supernatant at an Enhanced Biological Phosphorus Removal Wastewater Treatment Plant", J. Environ. Eng. Sci., 2005, 4, 265-277.
5. Sunil Jayant Kulkarni, Ajaygiri Kamalgiri Goswami, "Characterization, Treatment and Disposal of Sludge: A Review", International Journal for Research in Applied Science and Engineering Technology, 2014, 2(2), 516-517.
6. Sunil Kulkarni, PallaviAmale, "A Review on Advanced Oxidation Method for Waste Water Treatment", International Journal of Engineering Sciences and Management Research, 2015, 2(8), 33-38.
7. Pallavi Amale, Sunil Kulkarni, Kavita Kulkarni, "A Review on Research for Industrial Wastewater Treatment with Special Emphasis on Distillery Effluent", International Journal of Ethics in Engineering & Management Education, 2014, 1(9), 1-4.
8. Sunil Jayant Kulkarni, Ajaygiri Kamalgiri Goswami, "A Review on Wastewater Treatment for Petroleum Industries and Refineries", Int. Journal on Scientific Research in Science, Engineering and Technology, 2015, 1(3), 280-283.
9. Kulkarni SJ., "An insight into research and studies on biogas generation from waste", Int. J Res Rev., 2016, 3(5), 78-81.
10. N.H.S. Ray, M.K. Mohanty, R.C. Mohanty, "Anaerobic Digestion of Kitchen Wastes: Biogas Production and Pretreatment of Wastes, A Review", International Journal of Scientific and Research Publications, 2013, 3(11), 1-6.
11. Rajendra Singh, Amrit B. Karki, Jagan Nath Shrestha, "Production of Biogas from Poultry Waste", International Journal of Renewable Energy, 2008, 3(1), 11-20.
12. Momoh, O.L. Yusuf; Nwaogazie, L. Ify, "Effect of Waste Paper on Biogas Production from Co-digestion of Cow Dung and Water Hyacinth in Batch Reactors", J. Appl. Sci. Environ.

Manage, December, 2008, 12 (4) 95 - 98.
13. Sharma Soniya, "Management of Hazardous Waste-Opium Marc", International Research Journal of Environment Sciences, 2014, 3(8), 64-66.
14. Mane Ashish Vilas, "A Critical Overview of Legal Profile on Solid Waste Management in India", Int. J. Res. Chem. Environ., 2015, 591), 1-16.
15. Nkechi Chuks Nwachukwu, Frank Anayo Orji and Ositadinma Chinyere Ugbogu, "Health Care Waste Management-Public Health Benefits, and the Need for Effective Environmental Regulatory Surveillance in Federal Republic of Nigeria", Current Topics in Public Health, Intechopen, 2013, 149-180. http://dx.doi.org/10.5772/53196
16. Andrea Arjona Amador, "A Hazardous Waste Management Solution For Bogota", A Project Report Presented to The Faculty of the Department of Anthropology San José State University, 2010, 1-264.
17. Ololade, I.A., Adewunmi, A. Ologundudu, A. and Adeleye, A., "Effects of Household Wastes on Surface and Underground Waters", International Journal of Physical Sciences, 2009, 4(1), 022-029.
18. John Sutherland Earle, "Rotary Kiln Incineration of Hazardous Wastes: Pilot-Scale Studies at Louisiana State University", A Dissertation Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Louisiana State University, December 2003,1-176.
19. Von Lina Lau, "Case Study on the Management of Waste Materials in Malaysia", Forum Geoökol, 2004, 15 (2), 7-15.
20. Paul Lichtberger, "Hazardous waste management in a natural heritage site: A case study from the Sagarmatha National Park and Buffer Zone in Nepal", Sommersemester 2015, 1-155.
21. Dana Adamcova, Magdalena Daria Vaverkova, Bohdan Stejskal, Eliska Brouskova, "Household Solid Waste Composition Focusing on Hazardous Waste", Pol. J. Environ. Stud., 2016, 25(2), 487-493.
22. Takele Tadesse, "Solid Waste management", University of Gondar In collaboration with the Ethiopia Public Health Training Initiative, The Carter Center, the Ethiopia Ministry of Health, and the Ethiopia Ministry of Education, August 2004, 1, 1-120.

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