

Hierarchy of Sustainable Waste Management

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Abstract— It is major problem in india, to manage and dumping of solid waste. Due to these problems like air pollution, ground water pollution, bad smelling & mosquitoes generated which create diseases. The waste management hierarchy is a concept that promotes waste avoidance ahead of recycling and disposal. The shortened version of the hierarchy, ‘reduce reuse recycle’ is frequently used in community education campaigns, and has become a well-recognized slogan for waste reduction and resource recovery.

Key words: Solid, waste, management, waste collection, disposal, Hierarchy of Sustainable Waste Management

I. INTRODUCTION

Solid waste is the unwanted or useless solid materials generated from combined residential, industrial, and commercial activities in a given area.

Management of solid waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life.

The waste management hierarchy is a concept that promotes waste avoidance ahead of recycling and disposal. The shortened version of the hierarchy, ‘reduce reuse recycle’ is frequently used in community education campaigns, and has become a well-recognized slogan for waste reduction and resource recovery. The purpose of this paper is to review the continuing relevance of the hierarchy as a guiding principle, particularly in the context of: Sustainability goals, which need to consider complex relationships between impacts (such as waste and energy) and between systems (physical, social and Economic systems) rather than focusing on single issues; The rapid development of new technologies for waste recovery, such as gasification and commercial composting; and New concepts and trends in product policy, including Product Stewardship, Life Cycle Assessment, eco-innovation and eco-efficiency (i.e. dematerialization).

The theme of the paper is sustainability and how the hierarchy could be reinterpreted or reapplied in a more focused way to deliver socio-environmental outcomes that are preventative in nature.

Significant change within a relatively short timeframe is essential if we are to achieve a sustainable future. This means that society can no longer continue with the ‘incremental change’ approach. There is potential for a more sophisticated role for the hierarchy as a way of shifting to more sustainable systems of production and consumption.

A. Objectives:

- To ensure the protection of the environment through effective waste management measures.
- To protect the health and wellbeing of people by providing an affordable waste collection service.
- Grow the contribution of the waste sector to GDP.
- Increase number of jobs within waste services, recycling and recovery sectors.

- Ensure the design and manufacture of products that avoid or minimize waste generation.
- Discourage waste generation through cost reflective and volume based tariffs.
- Increase consumer awareness of waste minimization issues.
- Increase reuse and recycling rates of products.
- Ensure separation at source in all metropolitan and local municipalities.
- Encourage waste to energy options.
- Support the diversion of high calorific waste from landfill to recovery options.
- Stabilize quantity of waste disposed to landfill then reduce this volume.
- Increase thermal treatment and conversion of waste to energy.
- Remediate priority areas of contaminated land.
- Clarify extent of state liability for contaminated land.
- Develop national and local awareness campaigns on the social importance of waste management.
- Create a culture of compliance with Waste Act regulations
- Private sector capacity mobilized to support waste service delivery and community based collection models.

B. The Hierarchy of Sustainable Waste Management:

The Hierarchy of Sustainable Waste Management (Figure 1) developed by the Earth Engineering Center at Columbia University is widely used as a reference to sustainable solid waste management and disposal.

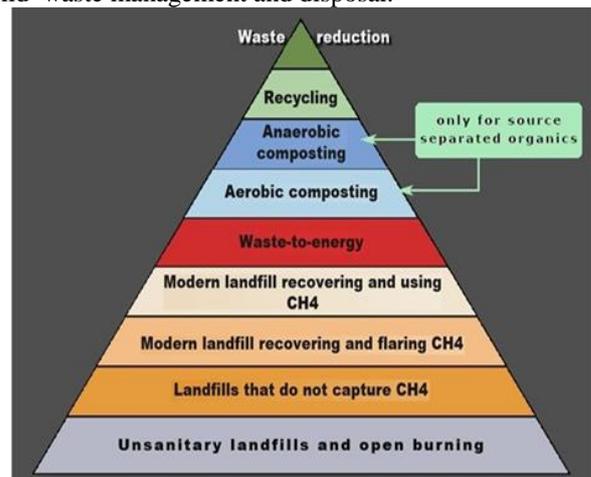


Fig. 1:

This report is presented in reference to this hierarchy. For the specific purpose of this study, “Unsanitary Land filling and Open Burning” has been added to the original hierarchy of waste management which ends with sanitary landfills (SLFs).

The hierarchy of waste management recognizes that reducing the use of materials and reusing them to be the most environmental friendly. Source reduction begins with reducing the amount of waste generated and reusing materials to prevent them from entering the waste stream. Thus, waste is not generated until the end of "reuse" phase. Once the waste is generated, it needs to be collected. Material recovery from waste in the form of recycling and composting is recognized to be the most effective way of handling wastes.

Due to technical and economic limitations of recycling; product design; inadequate source separation; and lack of sufficient markets that can use all sorted materials, most of the MSW generated in India ends up in landfills. Local authorities should start working with their partners to promote source separation. While this is being achieved and recycling is increased, provisions should be made to handle the non-recyclable wastes that are and will be generated in the future. A sustainable solution to handle non-recyclable waste is energy recovery. Energy recovery from wastes falls below material recovery. Land filling of MSW is equivalent to burying natural resources which could be used as secondary raw materials or as sources of energy.

However, in the present society, landfills are required as a small fraction of wastes will have to be land filled. However, unsanitary land filling or open dumping of wastes is not considered as an option to handle MSW and is not at all recommended.

II. CONCLUSION

A hierarchy, whose levels operate in isolation of each other, serves to undermine the concept itself. Inherent in the hierarchy levels is that they are linked by way of preference and benefit, thus the importance of viewing the entire concept as a model for increasing resource use efficiency and reducing impacts associated with consumption. A potential solution involves initiatives and tools that are explicitly hierarchy driven yet customized according to a specific product, sector or geographic location. This would then require detailed development of actions and associated metrics to ensure broader sustainability goals are achieved. Tools that can cut through the rhetoric of environmental jargon are vital in delivering real world outcomes that are quantifiable. For Victorians one of the more significant challenges in realizing a sustainable future is the interim process and how it can facilitate the desired outcome. At an international level the research, debate and policy development process is striving to engage with the shift from waste management to resource efficiency, however, this phase clearly presents a major test to the fundamental nature of how society functions. A significant issue is how the concept of sustainability and its sub components like the hierarchy can be developed into programs that are effective across sectors, disciplines, communities and professions. Strategic thinking and creative action ought to become a mainstream approach across all sectors. Intimate stakeholder involvement in policy formulation and implementation, underpinned by good science and enhanced with effective communication and education, represents a vital part of an evolving solution.

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