IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A Study On Urban Solid Waste Management In Madanapalle Muncipality

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Abstract

Urban Solid Waste Management presents significant challenges for India and the world. Various types of waste are generated from urban activities, including residential, agricultural, industrial, mining, and biomedical sources. These materials are often discarded as unusable. Effective urban waste management not only involves the disposal of waste but also emphasizes the reduction of waste generation. Proper collection and secure disposal methods are crucial. In India, common disposal methods include open dumping, ocean dumping, sanitary landfilling, composting, and incineration. Waste collection typically involves fixed storage bins, with refuse stored until collected by larger vehicles for transfer to disposal sites. Popular collection methods include community storage points, kerb side collection, and block collection. The implementation of reduction, reuse, and recycling (the 3Rs) presents additional opportunities for improving waste management. Poor solid waste management poses serious risks to both environmental integrity and public health.

Keywords: Solid Waste, Landfill, Management, Methods, Environment, Public Health.

Introduction

Our planet is a beautiful place, rich in natural resources, but these resources are increasingly insufficient to meet human demands and support economic activities. Urbanization and industrialization have contributed to global warming and highlighted the risks of overwhelming the planet's capacity to manage our waste. Solid waste management encompasses the processes of storing and disposing of solid waste, as well as recycling materials that should not be treated as trash. Throughout human history, from villages to urban areas, waste management has been a persistent issue. Solid waste management includes the disposal of solid, liquid, and gaseous waste. With a population of around 1.21 billion, India's urban population exceeds 377 million, making up 31.16% of the total population. According to the 12th Schedule of the 74th Constitution Amendment Act of 1992, urban local bodies (ULBs) are tasked with maintaining cleanliness in cities and towns. This study focuses on the Madanapalle Municipality in Andhra Pradesh.

Importance of the Study

Effective municipal solid waste management is essential for controlling pollution and is a critical task for management authorities. Proper management can prevent air, water, and soil pollution, and mitigate the risks associated with improper waste disposal, which can lead to the generation of harmful gases and leachates due to microbial decomposition, climatic conditions, waste characteristics, and landfill operations.

Objectives of the Study

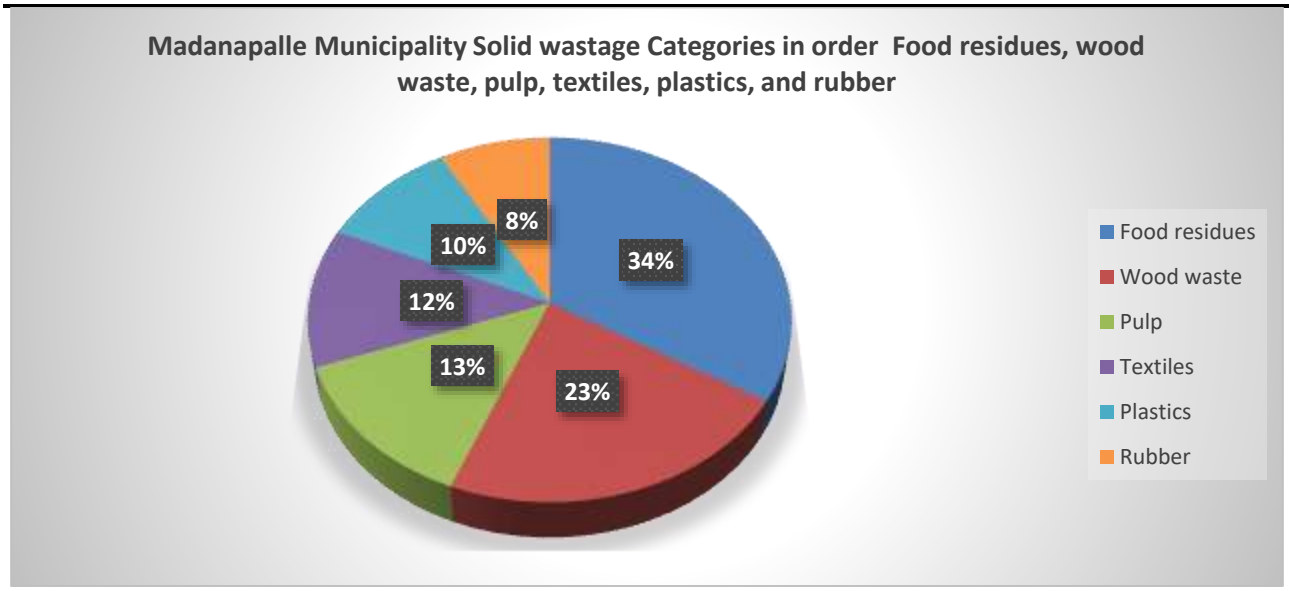
- To understand the causes of pollution due to solid waste.
- To observe the methods employed by municipalities for solid waste management.
- To identify methods for controlling solid waste generation.

Materials and Methodology

This study utilizes secondary data collected from the Madanapalle Municipality. Incineration is one disposal method for certain toxic wastes, like medical organic waste, though it raises concerns about air pollution. Recycling is crucial for protecting both the environment and public health, as waste can contaminate air and water. Decomposing waste releases toxic gases that can lead to respiratory problems. Municipal solid waste (MSW) is typically categorized into six groups: food residues, wood waste, pulp, textiles, plastics, and rubber. Each of these categories can be further subdivided. Properly regulated waste management supports society both economically and socially through recycling and reuse. Key components of solid waste treatment include on-site management, processing and storage, waste collection, transfer and transportation, reduction, and final disposal. Solid waste encompasses various types of refuse, including trash, construction debris, industrial waste, sewage sludge, and more, and effective urban solid waste management practices can be organized into six functional components from generation to final disposal.

Table; 1. Madanapalle Municipality Solid wastage Categories in order Food residues, wood waste, pulp, textiles, plastics, and rubber.

S.no	Type of Solid wastage	Percentage
1	Food residues	33 %
2	Wood waste	22 %
3	Pulp	13 %
4	Textiles	12 %
5	Plastics	10 %
6	Rubber	8 %



Overview of Solid Waste Management

The implications of ensuring adequate availability of essential materials and our progress in this area are often poorly understood, being primarily viewed through an economic and manufacturing lens. A crucial aspect driving the development of waste management technologies is the planet's capacity to process our waste. Urban solid waste management practices, from generation to final disposal, can be categorized into six key components:

1. **Generation of Waste**
2. **Storage of Waste**
3. **Collection of Waste**
4. **Transportation of Waste**
5. **Process of Segregation**
6. **Disposal of Waste**

Integrated Waste Management

Integrated waste management is a framework that encompasses the design and optimization of modern waste disposal systems, considering both technological and non-technical factors. With new regulations and a growing recognition of waste management as a vital sector, public involvement and awareness are essential for the success of recycling and recovery initiatives. For example, widespread resistance to incineration stems from concerns about dioxins, despite its effectiveness in reducing waste volume. Thus, advancements in emissions control and gasification techniques are vital for managing atmospheric pollutants.

Effective implementation of waste treatment systems requires public engagement to address the local needs and concerns surrounding waste disposal. Collaborating with government, businesses, and informal sectors is crucial for promoting environmental education and facilitating public participation. As the planet's carrying capacity is increasingly threatened by economic activities, resource competition intensifies, underscoring the importance of community engagement in waste reduction efforts.

Waste Disposal Methods

Composting involves vermin composting biodegradable waste, such as kitchen scraps and garden debris, typically using racks sized 6.21 m x 1.56 m x 0.62 m, made of steel, with a processing time of about two months.

Landfilling entails storing waste in designated areas, typically on elevated land, utilizing inorganic materials for disposal.

Recommendations

- Separate useful and harmful solid wastes.
- Promote recycling and recovery of materials.
- Implement waste processing methods like composting and vermi composting.
- Focus on resource recovery and responsible disposal.

Conclusion

Despite the rise of new solid waste management techniques, landfilling remains the predominant method in northeastern Illinois. The creation and closure of landfills pose risks to groundwater due to leachate and air quality from gas emissions. Although monitoring can mitigate risks over time, improper management can lead to significant public health hazards.

Data shows that food and vegetable scraps constitute a major portion of waste, followed by paper and inert materials. Manual separation at dumping sites in villages has proven effective for recovering materials like metal, plastic, glass, and rubber. Future strategies should prioritize environmental protection through reduction, recycling, reuse, and recovery.

- Annual reports should outline solid waste collection strategies.
- Litter bins should be provided in public areas, with mandatory segregation at the source.
- Community engagement, political support, and public participation are crucial for effective regulatory enforcement and comprehensive urban waste management.
- Adequate health and safety measures must be implemented for workers involved in waste handling.
- Given the distance to dumping sites, establishing a recycling plant could optimize transportation and reduce costs.

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