



Trends And Problems Of Municipal Solid Waste Management In The District Of Balasore, Odisha And Prospects For A Sustainable Development

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Abstract:

Municipal solid waste management has emerged as one of the greatest challenges facing environmental protection agencies in the small townships of a developing country like India. This study presents the current solid waste management practices and problems in the district of Balasore Odisha. Solid waste management is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal. Solid waste management deals with the way resources are used as well as with end-of-life deposition of materials in the waste stream. Often complex decisions are made regarding ways to collect, recycle, transport, and dispose of municipal solid waste (MSW) that affect cost and environmental releases. On the other hand, technologies like mechanical sorting, or disposal of MSW in landfills do not really improve MSW management efficiency. Landfills should become the ultimate disposal site of a few inert residuals from MSW valorization. Despite all this, conventional landfills for disposal of mixed MSW are still being constructed, with landfill site selection being a major social problem due to the lack of public acceptance; objectivity in landfill site selection is therefore extremely important. The study suggested study of institutional, political, social, financial, economic and technical aspects of municipal solid waste management in order to achieve sustainable and effective solid waste management in the small township of Balasore. We conclude that there is a real need for rational MSW management based on high quality scientific input.

Keywords: MSW, valorization, solid waste management, sorting at the source, recycling, Waste disposal, Waste Collection, Municipal solid waste, Balasore, Odisha, Recycling

1. Introduction

Consequence of our lifestyle, waste does not cease growing in quantity, in complexity even in harmfulness. A waste is not an ordinary product, and some wastes may be turned into resources. Moreover some by-products and discarded items are not exactly wastes but 'secondary resources'; they are collected for reuse as recovered products or for recycling as recovered materials. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but in the indefinite future. Sustainability is a process which tells of a development of all aspects of human life affecting sustenance.

Municipal solid waste (MSW) is defined to include refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste, and street sweepings. Municipal solid waste management (MSWM) refers to the collection, transfer, treatment, recycling, resources recovery and disposal of solid waste in urban areas. The goals of municipal solid waste management are to promote the quality of the urban environment, generate employment and income, and protect environmental health and support the efficiency and productivity of the economy.

Solid waste management has emerged as one of the greatest challenges facing state and local government environmental protection agencies in Balasore, Odisha. The volume of solid waste being generated continues to increase at a faster rate than the ability of the agencies to improve on the financial and technical resources needed to parallel this growth. Solid waste management in Balasore is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal of solid waste. This paper aims to examine current solid waste management practices and problems and discussion of applicable solutions to the solid waste management system.

2. Materials And Methods

In this research study the author took into consideration of four major cities namely Balasore, Sora, Nilagiri and Chandipur. The selection of the municipalities is based on the existing situation with different waste management problems, size, and challenges. Among these four Balasore is a old city and district headquarter and among the other three Sora is a small township where as Nilagiri & Chanipur are urban centers.

The author had conducted a survey involving student volunteers from nearby colleges during 2010-2012 to locate unauthorized open dumps. These volunteers were trained to locate dumps, assess the composition, assess the spatial extent of dumps and to mark locations

using hand-held pre-calibrated GPS (Global Positioning System). This study was mainly conducted in outskirts of the city in the buffer of 10 km. This study was conducted in two phases i.e. locations were randomly located and area was estimated visually and 20% locations were physically measured and verified by expert group. In order to analyze the unauthorized dumping of waste in open drainage channels, a random survey in three water catchments and drainage paths in the city was conducted. This was followed by the field visit during rainy season in 2011 & 2012 to check the severity of solid waste in drainage channels. Drainage channels were monitored starting from their origin in the upper reaches within the city up to locations where they merge to form very large flow type of drainages/ sewers. Then second survey was conducted in the selected flooding region of the city and rural areas. We conducted interviews with at least two local residents in each location to find out the flood level within houses, frequency of flood and duration of flood.

3. Results And Discussion

The statistical values for the physical characteristics of MSW samples for all the four cities are discussed in Table No. 1 and 2 followed by Statistical Chemical characteristics of MSW in table 3. The table gives the idea about maximum and minimum values for different parameters shown. This table directly gives the comparison of various parameters in different zones and the statistical values for the chemical characteristics. The values of organic matter obtained shows that the waste is suitable for composting. The C/N ratio values for all the zones of the city shows appreciable values required for composting. The Nitrogen values were also found to be in the range of values which are reported in literature for other Indian cities.

Waste Composition	<i>Balasore</i>	<i>Sora</i>	<i>Nilagiri</i>	<i>Chandipur</i>
Garbage	45.56	48.23	46.87	48.32
Plastic	3.67	4.21	5.65	3.89
Bottles/Glass	6.89	6.23	5.89	5.75
Paper/Cardboard	25.45	28.26	29.56	27.25
Metals	2.65	3.56	3.89	2.98
Fabric	8.89	7.98	7.56	8.97
Miscellaneous	6.89	1.53	0.58	2.84

Table 1: Zone wise unauthorized waste disposal (%) sites based on survey

Sources	<i>Balasore</i>	<i>Sora</i>	<i>Nilagiri</i>	<i>Chandipur</i>
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Residential	61.25	55.25	56.56	59.98
Commercial	25.23	24.23	22.69	26.31
Industrial	2.45	2.21	2.63	2.56
Institutional	7.36	8.23	6.28	6.45
Others	3.71	10.08	11.84	4.7

Table No.2: Solid Waste Composition (%) of Selected Locations

Chemical Characteristics	Balasore	Sora	Nilagiri	Chandipur
Moisture content	33.23±2.25	34.47±2.64	36.47±3.94	32.47±3.24
Organic Matter	31.26±3.94	28.24±6.89	26.31±7.21	29.48±5.98
Nitrogen	0.658±0.112	0.785±0.21	0.877±0.12	0.978±0.14
C/N Ratio	33.21±13.94	39.51±15.64	37.56±12.65	33.21±17.08
PH	8.586±1.394	9.546±1.456	9.568±1.785	8.256±0.997

Table No.3: Statistical Chemical characteristics of MSW

4. Conclusion

A comprehensive survey on the solid waste generation of Balasore city and the potential of its recyclable components has been examined. It has been found from the predictions that the solid waste generation in the city is presently very high and may become worse in future. Moreover, the MSW has a good potential of recyclable values. Hence it is recommended that the concerned authority should focus more on developing effective means of waste minimization and recycling. As extension to this study, a mathematical model may be developed and solved to have more realistic predictions. Finally, we wish that this study brings some information useful for the elaboration of effective policies of management of household waste in the city of Balasore, Odisha.

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