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# Analysis of Municipal Solid Waste (MSW) Management in Budhwara Area of Amravati City

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**ABSTRACT:** Waste management and its disposal is the most severe environmental issue in all over the World. In India, the volume of waste generation has been increasing rapidly over the last few years. Every year India faces a massive challenge as it deals with municipal solid waste equating to approximately 62 million tonnes including plastic wastes, medical waste and specially E-waste which recently contributed considerably to total waste stream due to utilization of electronic and other items specially after COVID-19. Approach towards Solid waste management in India is still unscientific. In the developing country like India, this increase in Municipal Solid Waste (MSW) is also due to urbanization and population growth. This boom of industrialization, urbanization and population growth is directly correlated with increased solid waste generation. These wastes may cause a potential hazard to human health or environment if any of the aspects of solid waste management is not managed effectively. Proper waste management is a fundamental key to environmental sustainability. This study describes about current status of Municipal Solid Waste Management (MSWM) and disposal methods in Budhwara Area of Amravati City. The characteristics and composition of wastes and the environmental issues associated with its management are also analysed. Environmental and health issues arising from the unsustainable management of the wastes were assessed from field observations in this study. The results indicate how the waste dump sites (designated and non-designated) on the major streets and several open spaces are left unattended for long periods such that the rubbish heaps; encroach on the roads thereby limiting the road users access, generate serious air pollution issues, constitute significant nuisance when blown over by winds, and distorts the aesthetic view of the area. The results also show that the composition of wastes in the area is heterogeneous because it contains both biodegradable and non-biodegradable materials such as e-wastes, plastic, polythene materials, hospital wastes, and various types of wastes amongst others. This report dissects the state of solid waste management in the Budhwara area and offers recommendations to solve the myriad challenges.

**KEYWORDS:** Municipal Solid Waste (MSW), and Waste Management.

## I. INTRODUCTION

Solid waste is a material that is not useful and does not represent any economic value to its owner (Kadam and Sarawade, 2016) [8]. Solid waste management (SWM) is an acute problem for developing countries like India. Escalating incomes, rapidly growing but unintended urbanization, and altering lifestyles leads to increased volumes and varying composition (increasing use of paper, plastic and other inorganic materials) of municipal solid waste in India. Waste is generated from all human activities. The Municipal Solid Wastes (Management & Handling) Rules, 2000 (MSW Rules) [14] implies on every municipal authority responsible for collection, segregation, storage, transportation, processing and disposal of municipal solid waste. These rules contain four schedules namely implementation schedule, management of municipal solid wastes, specifications for landfill sites and standards for composting treating leachates and composting, etc. (MOEF, 2000). Municipal Solid Waste has been a major issue in developing countries like India. There is rapid increase in population, developmental activities, improvement in the standard of living etc. and thus a simultaneous increase in the generation of wastes which eventually becomes a major environmental, socio-economic and health concern (Gupta et al, 2015) [6]. The urban MSW in India constitutes of 51% organics, 17.5% recyclables (paper, plastic, metal, and glass) and 31% of inert. The moisture content of urban MSW was found to be 47% and the average calorific value was 7.3MJ/kg (1745kcal/kg) (Parvathamma, 2014) [17]. In India the most common method used for the management of municipal solid waste is that is disposed off in low lying areas or open dumps without any necessary precautions. It is the reason that municipal solid waste management is one of the most challenging environmental issues here (Siddiqui, 2018). In the present study, an attempt has been made to provide a comprehensive overview of the current status of the MSW in the Budhwara Area of Amravati City (Maharashtra), the health and environmental impact of the MSW, the problems and challenges being faced and the recommendations that could be made to improvise the situation, with some simple and effective international trends in waste management, with a vision of improving in current Indian systems.



## II. RELATED WORK

In [1], the review helps to identify the different types of wastes with potential of utilization towards construction and several key research factors and criteria which can provide focus and direction towards the choice of waste-type to be used and ensuring that they have utilization potentials in the various value-addition applications. In [2], The review discusses the possible resource recovery from waste in the IHR, corrective measures introduced by the government specific to IHR and, the way forward for improved SWM for achieving sustainable development of the IHR. In [3], the present status is described, challenges and implementation followed in the waste reduction processes including segregation/ collection, recycling, energy recovery (composting, bio methanation, and bioremediation), land filling of household and industrial waste; its impact on the environment. In [4], the paper dissects the state of solid waste management in India and offers recommendations to solve the myriad challenges. In [5], the extent of study includes management of solid waste adopted in the Amravati city by vermicomposting. In [6], the objectives of inscription of this paper is to study the existing practices related to the various solid waste management initiatives taken and challenges faced in managing municipal solid waste. In [7], the present system is focused on collection and transportation of largely mixed unsegregated waste. In [8], the review gives priority to move from reliance on waste dumps that offer no environmental protection, to waste management systems that retain useful resources within the economy. In [9], the paper summarizes a collective, systematic effort which improves implementation of institutional arrangements, technology, operations management, human resource development, and public participation and awareness of Integrated SWM systems. In [10], the work mainly focuses on Hospital waste management for Amravati city, which consists of collection, segregation, storage, transportation, treatment and disposal.

## III. METHODOLOGY

Practices across Amravati region especially the existing SWM systems face major challenges associated with inadequate facilities of solid waste collection, transportation, treatment, and disposal. the following practices are being carried out in Prabhag 14, Budhwara area of Amravati city.

Following analysis is done accordingly: 1. Analysis of collection and segregation of municipal solid waste mostly across the area, door-to-door garbage collection systems have been employed with the collaboration of the informal sector, private agency, non-government organizations (NGO's), housing society, through tipper trucks, dumper placers, and open body trucks, etc. 2. The waste segregation is attempted to be carried out at the source in different color-coded bins for wet biodegradable waste, non-biodegradable waste, and domestic hazardous waste. 3. Analysis on rag pickers/scrap dealers is also observed and how they segregate waste in most municipal bodies from the source using large waste sacks to collect non-biodegradable recyclables such as plastics, glass, metals, cartons, etc. 4. Status of total solid waste generation, collection, treatment, and landfilled in the area Sutli - Banarsi. 5. A total waste quantity generated was estimated in particular area for solid waste management. mostly, due to lack of community involvement, the usage of centralized bins/dumpers remains inefficient, and consequently, the locations of these bins usually become the dirtiest and most stinky places in the town. 6. Transportation of municipal solid waste across the area is monitored, how MSW is primarily transported in covered vehicles to avoid spillage of the garbage along the route to the processing and disposal facilities. since improper way of transportation leads to littering of waste, and in the rainy season, leachate runoff from the vehicles into the streets is also observed. 7. Processing of MSW for a proper SWM plan and a sustainable environment was monitored, since all the collected waste should be subjected to various waste treatment techniques to obtain value-added products. Across the area, a large part of the biodegradable waste is subjected to composting in compost pits, whereas the inert and non-biodegradable waste is indiscriminately landfilled. however, organic waste composting is difficult to carry out in that area due to the lack of segregation at most sources, fewer processing facilities installed, and cold climate conditions. 8. The dominant fraction comprises biodegradable waste, followed by inert, ash and debris, paper, plastic, glass and ceramics, and metals. 9. A number of solid waste processing facilities operational in that area Sutli-Banarsi is observed. 10. After the analysis, the efficient scientific methods for the disposal of MSW is suggested for improving total process disposal of MSW which should be less or no harmful for our environment which may adversely affect the health of humans, animals, and soil productivity. After all this observation and analysis, Waste segregation is done. "Waste segregation" means dividing waste into dry and wet. Segregation at the source separation itself increases recycling efficiency. It also improves performance of waste treatment units due to good quality of feed and lesser amount of impurities. Also, 3R concept is utilized.

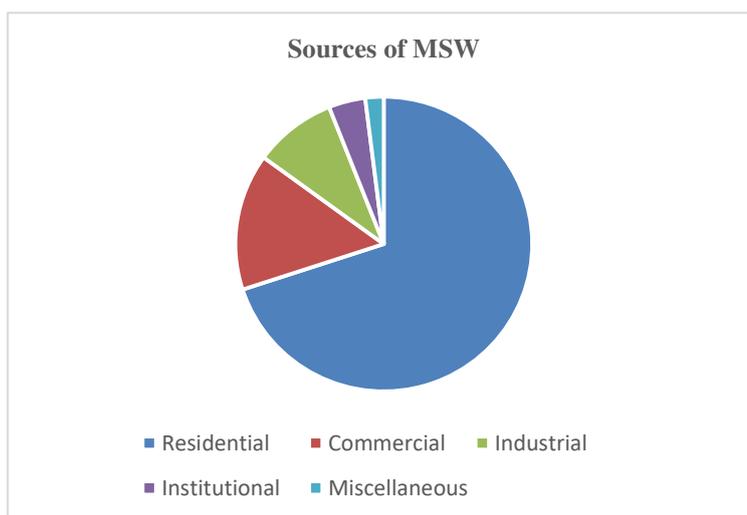
## IV. WASTE TREATMENT

The Waste treatment is finally done at Compost Depot which is situated at Sukhli road. The remaining final solid waste is disposed in landfills after necessary treatment to lessen the adverse environmental impacts. The objective

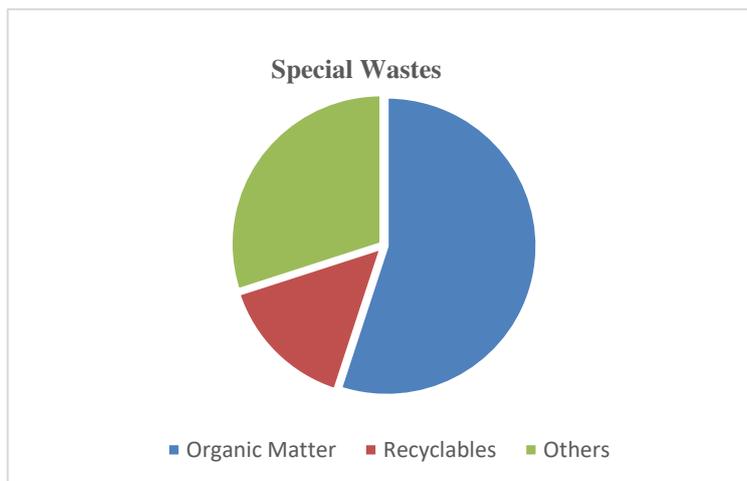
of treatment is to improve physical and/or chemical characteristics of waste, reduce toxicity and reduce waste. Common methods which are adopted for hazardous waste are chemical fixation, volume reduction, detoxification, degradation, encapsulation etc. Following are the waste treatment methods that are generally used in India and they are Composting, Aerobic Digestion, Biomethanation, Incineration, Pyrolysis and Landfills.

## V. RESULTS AND DISCUSSIONS

1. Sources of Municipal Solid Wastes in Budhwara Area: The sources of municipal solid waste in the area are obtained from the observation & analysis of the physical observation of the composition of the wastes in each waste dump site. This observation & analysis revealed that a greater percentage of the wastes emanate from the residential sector (70%), followed by the commercial sector (15%), industrial (9%), institutional (4%) while another miscellaneous sectors account for (2%). This is shown in Pie Chart.



2. Physical observation of the municipal solid waste in the waste dump sites indicates that the wastes are mostly composed of biodegradable and non-biodegradable materials. The biodegradable contents can be harnessed to more useful avenues by introducing appropriate technologies for processing them into bio-fertilizers or as a source of green energy through landfill technology or other waste to energy routes. This will also serve as a potential source of job creation and revenue generation for the State.



3. It is also seen that there are special wastes such as construction debris, leaves and street litter, abandoned automobiles, and old appliances that are collected and managed separately. It consists of organic matter (55%), recyclables (15%) and others i.e. inert (30%). Special wastes is shown in Pie chart.

4. The non-biodegradables could be recycled after being assembled by the waste/rag pickers. However, it is unfortunate to note that the waste/rag pickers are not currently recognized by Government.

5. The observations in this study indicates that MSW are made up of organic and other biodegradable matter and non-biodegradable made up of substantially dirt, ash and another household trash.

6. Impact of Unsustainable management of Solid Wastes in the area: The negative effect of unsustainable waste management in Budhwara is manifested in; environment pollution, road encroachment, air pollution, health, and in residential land encroachment.

7. Most of the non-decomposable solid wastes may contain harmful chemical elements which have severe health implications for humans. These heaps of solid wastes also serve as good breeding grounds and hideouts for reptiles, rodents, and other dangerous insects such as mosquitoes and flies.

## VI. CONCLUSIONS

1. From above results and discussion, MSW is properly managed in Prabhad no. 14, Budhwara Area of Amravati City but public involvement is much more needed to separate the waste at the source itself.



2. Despite the fact that Solid waste management practices has been improving in recent years, the pace of improvement needs to be accelerated and the measures mentioned in MSW rules must be implemented.
3. Time has come to encourage technology-based entrepreneurs to achieve effective solid waste management.
4. NGOs should be involved in various components of waste management including public awareness.
5. Public involvement in management of solid waste is of significant importance.

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