

Municipal solid waste generation and composition strategy in Hyderabad, India-A case study

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ABSTRACT:

Solid waste predominantly, is any garbage, refuse or rubbish which include- domestic, commercial and industrial wastes especially common for disposal. Solid waste should be handled and disposed off properly or else it poses numerous risks. Urbanization contributes enhanced municipal solid waste (MSW) generation and unscientific handling of MSW degrades the urban environment and causes health hazards. In this paper, an attempt was made to provide a comprehensive composition of MSW in Greater Hyderabad Metropolitan City (GHMC). The day pertaining to was carried out to evaluate the current status and identify the major problems.

Keywords: Municipal waste, solid waste, metro city, composition, Hyderabad

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I. INTRODUCTION:

Municipal solid waste management (MSWM), a critical element towards sustainable metropolitan development, comprises segregation, storage, collection, relocation, carry-age, processing, and disposal of solid waste to minimize its adverse impact on environment. Unmanaged MSW becomes a factor for propagation of innumerable ailments (Kumar et al., 2009).

India is rapidly shifting from agricultural-based nation to industrial and services-oriented country. About 31.2% population is now living in urban areas. Over 377 million urban people are living in 7,935 towns/cities. India is a vast country divided into 28 States and 8 Union Territories (UTs). There are three mega cities—Greater Mumbai, Delhi, and Kolkata—having population of more than 10 million, 53 cities have more than 1 million population, and 415 cities having population 100,000 or more. Hyderabad is one of the upcoming mega city with a current population of 64lakhs and it may reach by 2030 (Census, 2011). The waste generates from this greater community need to handle with utmost care.

It is very difficult to organize and manage that huge waste. Data on the generation and composition of solid waste is key in order to plan for the long term management of solid waste in an efficient and economical manner. Such management includes the selection and operation of equipment for the treatment and handling of waste, and the types of disposal facilities that will allow for energy

generation and resource recovery. The generation and composition of household waste are not homogeneous. They vary according to changes in consumer patterns and economic growth rates and depend upon standard of living, season of the year, day of the week, population habits and the geographical site of human settlement [Williams et al, 1998, Semarnat, 2001, S. Ojeda, 2006]. By the same token, the generation and composition of waste have been influenced by economic recessions, the impact of legislation and the economic instruments to increase or decrease their value, e.g., reuse and recycling (Williams et al, 1998).

In order to determine the generation and composition of MSW, different methodologies can be used for sampling. Sampling can be through door-to-door waste collection or directly from waste dumping site (Tchobanoglous *et al.*, 1994, Gomez et al, 2008). Dumping site will give the clear composition of the study area.

II. STUDY AREA:

April 2007 onwards hyderabad municipality was became greater Hyderabad municipal corporation (GHMC). Now GHMC is divided in to 6 zones (fig.1) (L.B. Nagar, Charminar, Khairathabad, Secunderabad, Serilingampally and Kukatpally) and 30 circles. GHMC extended up 650 sq km (GHMC, 2020). As per recent estimates, the municipal waste generation in metro cities varies between 0.2-0.6 kg/capita/day

(Agarwal et al 2005) and urban MSW generation is estimated to be approximately 0.49kg per capita per day. This is estimated to be two or three times.

However vary from city to city and the per capita waste generated in Hyderabad 0.62kg/day (Srinivas et al, 2016).

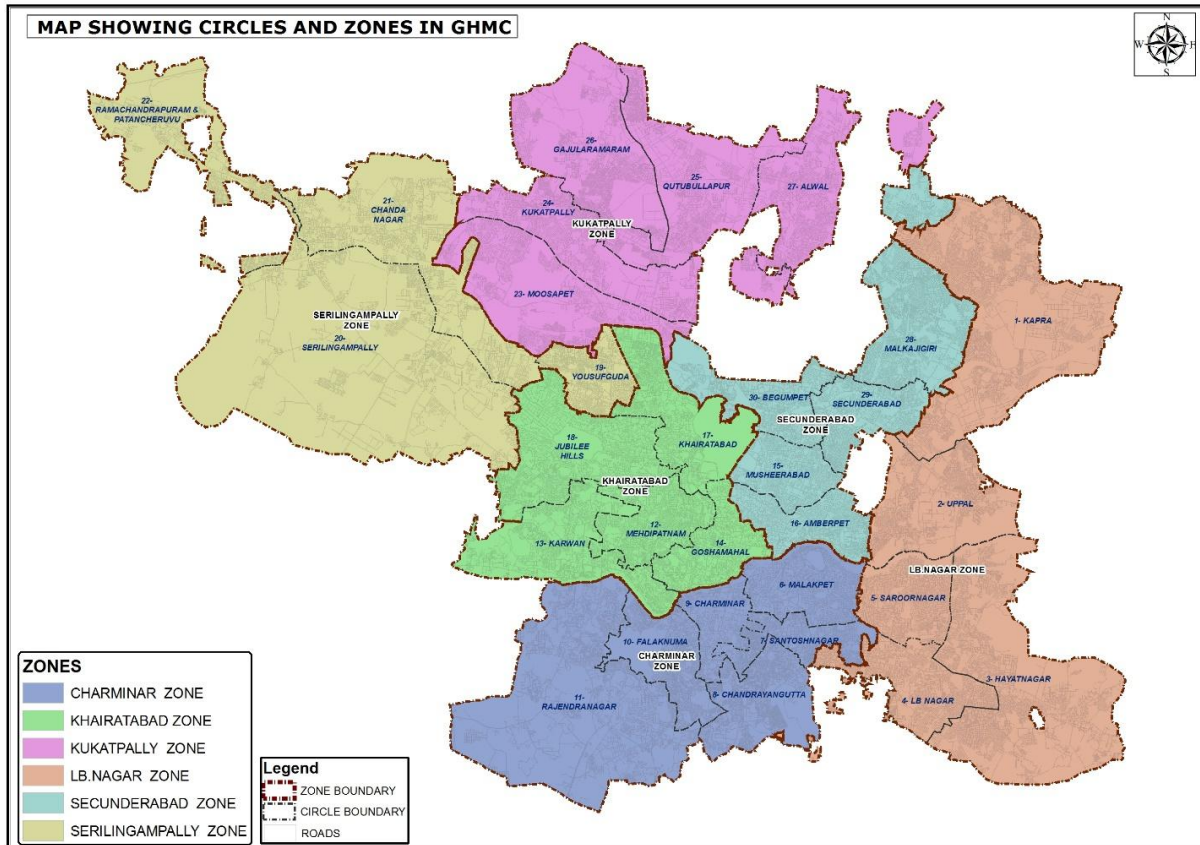


Fig.1: GHMC zones and circles

Methodology:

Primary data collected from the GHMC reliable sources and secondary data generated. Samples were

collected from the MSW management site as per standard procedure (Sridevi, 2015). The piles of the waste were represented in fig. 2.



Fig.2: Landfill site located in Hyderabad

Segregation of waste: Waste characterization consists of collecting waste at its source and directly sorting it out into types of materials. The collected waste was separated into dry waste and wet waste. This waste again sorted as into different categories like plastic, paper, textile, metal, gravel, glass and others. After segregating the solid waste weighed according to standard protocol (Srinivas, 2016).

III. RESULT & DISCUSSION

According to data collected from Greater Hyderabad Municipal Corporation, it is noticed that the generation of municipal solid waste is of two types these are Biodegradable waste and Non Biodegradable waste Bio degradable waste consists of easily degradable organic compounds, Garden waste, wooden materials, Paper & Cloth rags. It is a natural process & undergoes decomposition itself.

Biodegradable wastes can undergo decomposition naturally, without any treatment or disposal methods. The product obtained after decomposition process is used as manure in crop & agricultural fields to obtain more yield & available to farmers at cheaper cost. The generation & composition of bio degradable waste in dump yard is very high. When compared to others, the generation of easily degradable organic waste is high i.e. 44.3% (Fig.3). Non Biodegradable waste consists of metals, glass, ceramics, rubber, leather & Sand. These cannot be decomposed by a natural a process. These can be disposed by treatment or disposal methods. By depositing these materials large amount of pollutants are released into the environment there by polluting it. The generation of plastics/ bottles, are very high i.e. 22.0%, when compared to metals, glass etc.

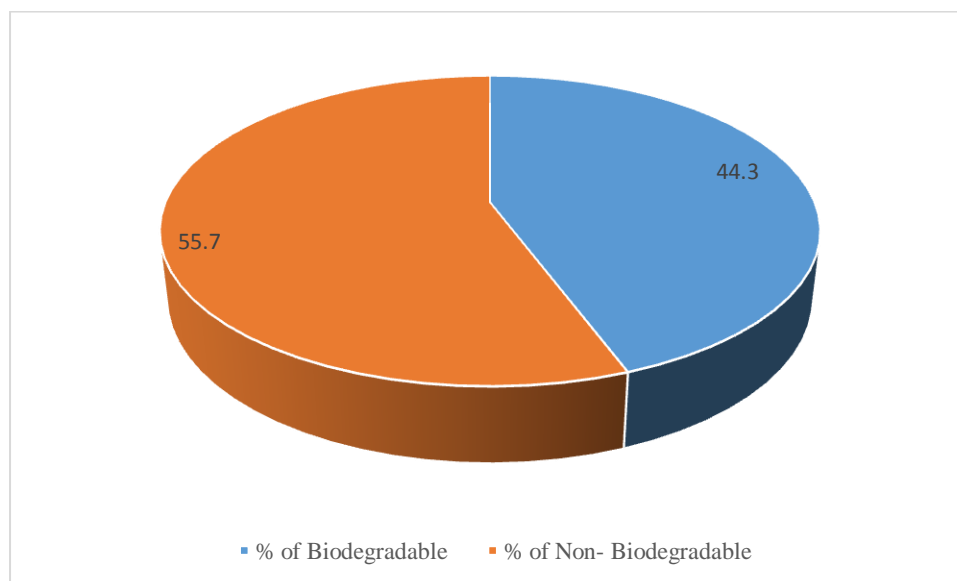


Fig.3: % of Biodegradable and Non- Biodegradable MSW of GHMC

From the composition analysis it was observed that the biodegradability of MSW was clearly observed (Fig.4,5). % of paper is decrease from 40% to 20% may be because of biodegradation

in the closed dumping site. The non biodegradable compounds % composition was still remains approximately similar after closer of the dumping site.

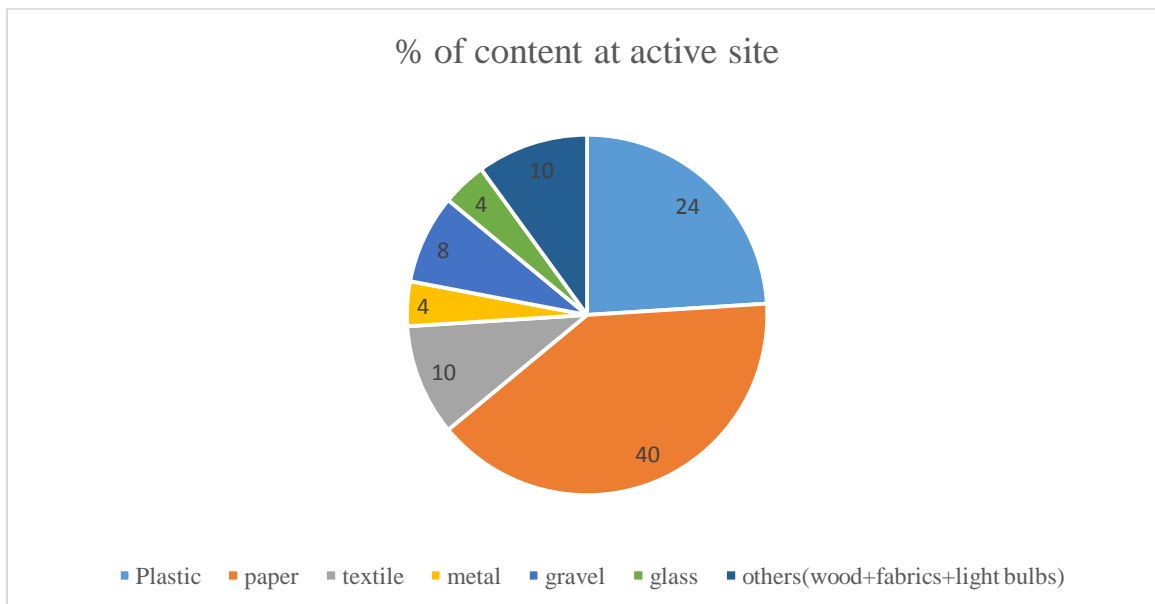


Fig.4: % of compounds content at active site

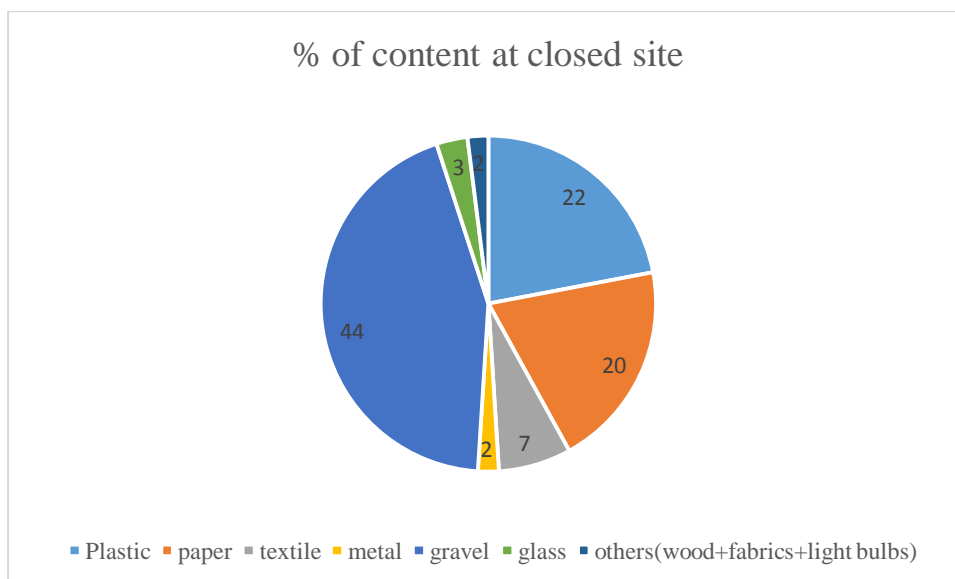


Fig.5: % of compounds content at closed site

IV. CONCLUSION AND RECOMMENDATIONS:

Municipal solid waste at Jawahar nagar is being maintained well by greater Hyderabad Municipal Corporation. Proper segregation of solid waste at the point source of generation is very important for easy & safe disposal. For proper management of municipal solid waste the municipal authorities should maintain the storage facilities in such a manner that they do not create unhygienic & unsatisfactory conditions.

Launching targeted efforts for development/acquisition of technologies for material and energy recovery from waste is the need

of the hour in India. To build confidence and test the application of such technologies in the context of developing countries pilot demonstration projects need to be established. This in turn will require extensive data collection on waste characterisation and quantification to facilitate assessment of recycling/recovery potential and design/development of technologies.

The study concludes that installation of decentralized solid waste processing units in metropolitan cities/towns and development of formal recycling industry sector is the need of the hour in developing countries like India.

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