

Pre-Monsoon Waste Characteristics in Gadhinglaj City

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Abstract: Waste Management is one of the obligatory functions of the U.L.B's in India but the service is falling too short of the desired level of efficiency and fulfilment, this consequential in problems of health, sanitation and degradation of environment. There are various cities like Mumbai, Delhi, Kolkata, Bangalore, and Chennai, in India are currently facing problems in managing their waste. This study is carried out with the approach of prevention from future consequences. The present work examines all aspect of waste management in Gadhinglaj city & highlights the existing problems & Provide appropriate suggestions on basis of observations, the primary information is collected through some sampling & testing results obtained by laboratories, some field survey & review of people also carried out for the same. Also secondary information is obtained from the municipal council & respective government & private organizations. After thorough investigation some interesting outcomes are come forward, those are discussed in paper. Due to less available resources & limited time the study may fall short in some investigations; the depth of investigation can be increased in future studies. This is a sincere attempt to improvise the existing system of waste management & the outcome illustrates the character of waste management system

Keywords: Municipal Solid Waste Management, Characteristics, Gadhinglaj, composting, composition of waste

1. Introduction

The rapid growth in population & urbanization from the beginning of 20th century leads to more generation of waste, which triggered off the waste management problems in urban area. The cities like Mumbai, Kolkata, Chennai, and Bangalore from India are already generating more than 1000 tons per day. It has been proved t that solid waste can cause significant health & environmental problems to society, WHO has already stated the dangerous consequences of untreated waste over health & environment, through water, land, & air pollution. The open dumpsites are being serves the source of food for insects like rats, Rodents; flies etc. which further cause spreading of various infectious diseases. The Gadhinglaj is well known sub district place from Kolhapur district. Per day generation of waste is about 5MT, which is handled by respective municipal council.

The city has shown rapid development in population as well as urbanization since last decade. The newly developed colonies & apartments around the city causing extra load on current waste handling system

The waste characteristic from in city is mostly organic, & it has potential for composting options. Appropriate SWM provides facility of collection, segregation, transportation, & treatment of waste, that will minimises risk of diseases & odour pollution, also good management improves the cleanliness & beauty of the city. Though SWM is complex to execute but with current eco-friendly technique & disciplinary work it is possible to achieve the needful.

Study Area: Gadhinglaj lies at (16° 10' N, 74° 20' E; p. 8,546) southwest corner of Maharashtra. It is is well known taluka place from Kolhapur district which is governed by municipal council over there. The total area is about 17.97 km². Because of availability of good education & medical facilities, the population of the city is constantly increasing; In addition to this Gadhinglaj serves as good market place for

surrounding villages in three taluka places i.e. Ajara, chandgad, & gadhinglaj. (Source: <http://en.wikipedia.org/>)

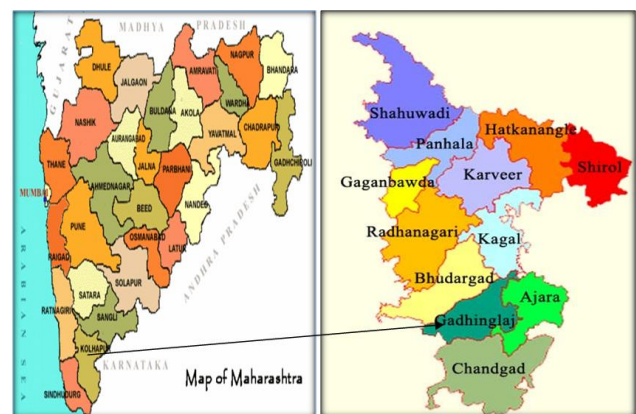


Figure 1: Location of Study Area

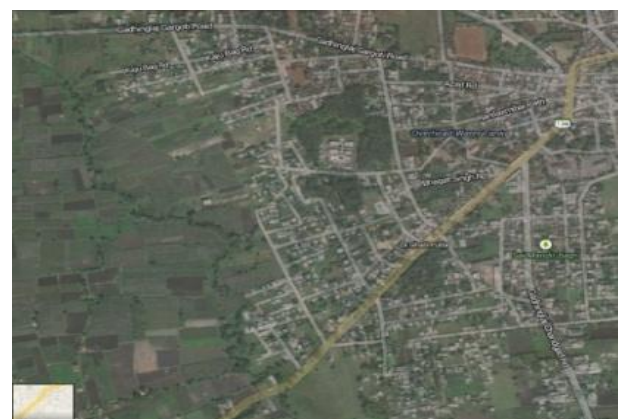


Figure 2: Satellite Map showing study area of Gadhinglaj

2. Materials and Methods

The primary data is collected through laboratory tests & field investigations. Whereas secondary data is collected from municipal council & other sources, such as government offices, websites etc. To identify characteristics separate

sampling is done at domestic, commercial locations & also at dumping site. These are tested in laboratory to understand the composition of waste at these locations.

3. Results and Discussion

A. Present S.W.M. Scenario In The City:

As per data by MPCB the city generates about 5 MT of waste per day which is significant amount. The waste from the city is moreover organic one but it has contained some amount of recyclable inorganic part. All the waste management activities are carried out as per solid waste management & handling rules 2000. For suitable waste management the city has been divided in five zones and work is also divided accordingly. Workers are doing daily 3000sq. m cleaning of roads & 300 m of gutters. But as considering growth of the city this manpower is not enough. Therefore private contractors invited by bidding & around 268000 sq. m of area are cleaned by private contractors. House to house collection system is adopted for collection of waste. Presently there are 6 refuse vehicles (tractor) (with 5workers), 4 push carts (with 2workers) are operate for collection. The Cost of collection is 3700Rs /day. currently all the waste is stored at Gadhinglaj dump yard, Neharunagar, the total area available for storage is 2 acres & storage capacity of the plant is 300 to 400 Tones, For Pedestrians 72 No of cement Dustbins are provided at certain places and 40 small dustbins are also placed at several places. Though waste from these bins is collected frequently, around 5 to 10% of waste remains uncollected. For disposal of solid waste, the facility of land filling is provided at 1km distance from the city. Also the composting plant is situated at the same place, there is need to inspect working & efficiency of the plant.

Characteristics of Waste:

Waste samples were collected from various places & their composition was determined through laboratory work. The major finding is that the waste from the city is moreover organic, At domestic source food scrap content is found to be 40%, & that of yard trimming is work out to be 14% it means the domestic areas like colonies & apartments generates more than 50% biodegradable waste which shows its potential for composting. But the same waste when carried to dump yard it mixed up with the waste from other areas such as commercial & market waste. So the percentage of food scrap at dump yard decreases to 24% of the whole, & that of yard trimming comes around 16%. The content of food scrap at the commercial places is very negligible (i.e. 8%). The composition of recyclable waste is found to be very interesting at commercial places (i.e. plastic, rubber, leather, and paper, metal. Glass Etc.). The total recyclable waste at dumpsite is found to be 46% but it is at domestic source is about 37% & that of 70% at the commercial source which shows the possible recyclable opportunities at these sources. Among recyclable waste plastic seems to be major part & waste papers are second major part. The 34% of part contains plastic at commercial end & 26% of waste contains papers. These observations show that the composition changes significantly according to locations of sources of waste. If the

collection of these wastes is done separately then there are opportunities of composting as well as recycling of waste. According to the sampling & testing the composition of waste is plotted in the graphs, which are shown in graphs No. 01, 02, and 03.

Moisture Content:

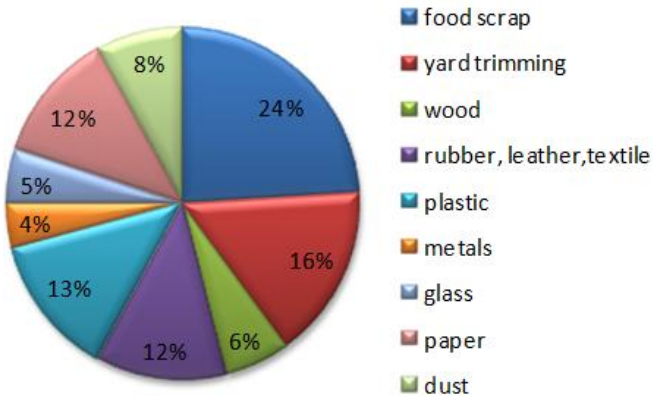
The percentage of wet weight of Solid waste material is called as moisture content. First of all categories of wastes are separated & 100gm of each category is taken for calculation of moisture content. From observations we can say that among all categories of waste, food waste containing maximum of moisture content, the graph No 04 is showing the percentage of moisture content in the waste, the food waste has more moisture content i.e. 58%. And other categories like paper, plastic, textile, rubber, leather, glass has less moisture content. The moisture content of yard trimming is 16% & that of wood part is 11%. The overall waste was found to be moist which shows that there is need for segregation of waste in wet & dry waste at domestic sources.

Temperature:

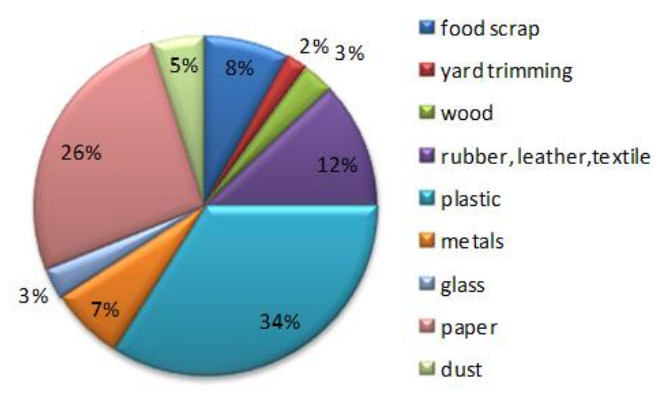
The temperature of waste is important characteristic of waste because the disposal facilities vary according to temperature; the high temperature waste can cause fire & smoke problems in landfills. The average temperature at the dump yard is found to be 29^o, average temperature at the domestic source is 27^o C & It is at commercial source is 26^o C (Shown in table No 01). Beyond that some fire incidences & smoke problems are found at the dump site which is result of increased temperature of waste.

4. Conclusion

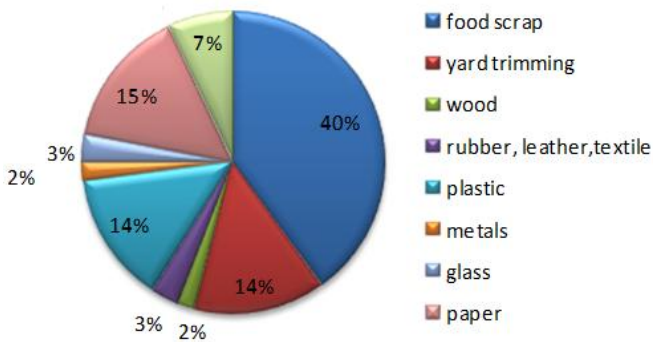
Solid waste management is one of the major environmental threats in front of world, the change in lifestyle of people, rapid development are responsible for large generation of waste, This waste is directly or indirectly causing problems to public health, drainage, cleanliness, beauty of the cities, Proper collection, storage, processing, transport & disposal of waste will lead to minimization of waste impacts, Gadhinglaj city is generating 5MT of waste per day, and the quantity of waste is considerable as compare to extent & development of city. Presently there is landfill (not engineered) facility for disposal of waste which is not efficiently working. Analysis of waste samples determines that the 40% food waste generated at the domestic source end which can be easily composted & dumpsite contains 46% of recyclable waste & It is 70% at commercial end which can be possible to recycle. The moisture content: food waste: 58%, Paper: 06, Plastic 01%, Textile 08%, yard trimming 16%, & Temperature of waste: the temperature of waste ranges from 26°C to 29°C, the temperature of waste is slightly higher at dump yard. With proper collection facilities & provision of competent disposal facilities the waste from the city can be managed well. So this study of waste composition at various sources will be useful to municipal council to understand the collection points of waste which are more beneficial.



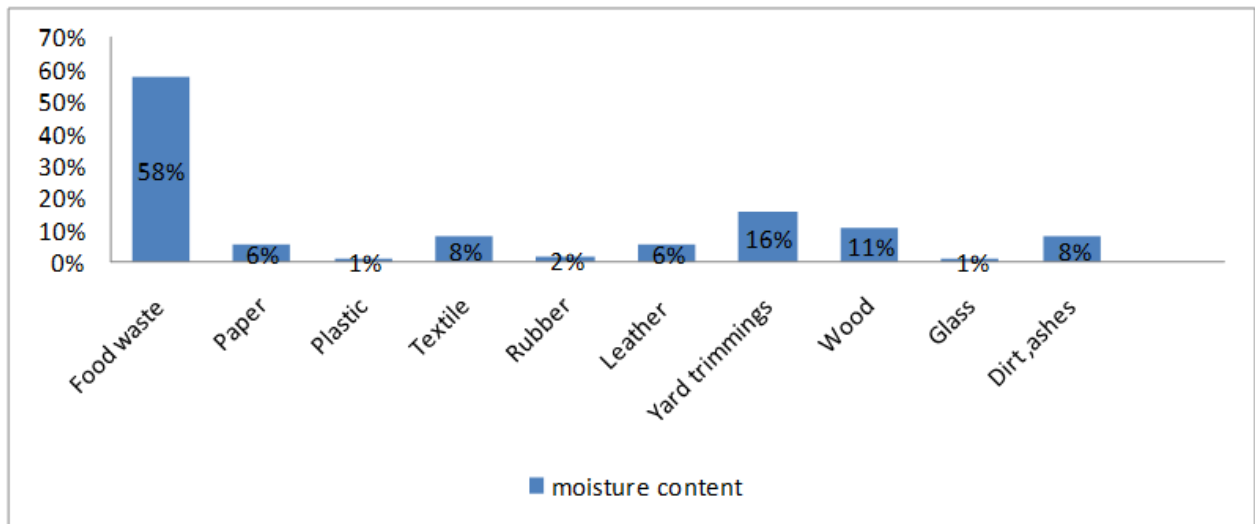
Graph No 01: Showing Composition of Waste from Sampling No 1 –At dumping yard (i.e. storage station)



Graph No 03: Showing composition of waste from sampling No 3 - At Commercial Source.



Graph No 02: Showing composition of waste from sampling No 2- At Domestic Source



Graph No 04: Moisture content chart

Table 1: The table showing observed values of temperature of waste

Source	(Temp) T1	T2	T3	T3	T5	Avg. Temp (°C)
						(Round off)
At storage station(dumpsite)	29	28	29	29	30	29°C
At domestic source	27	26	28	29	27	27°C
At commercial source	26	25	25	26	26	26.°C

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