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:

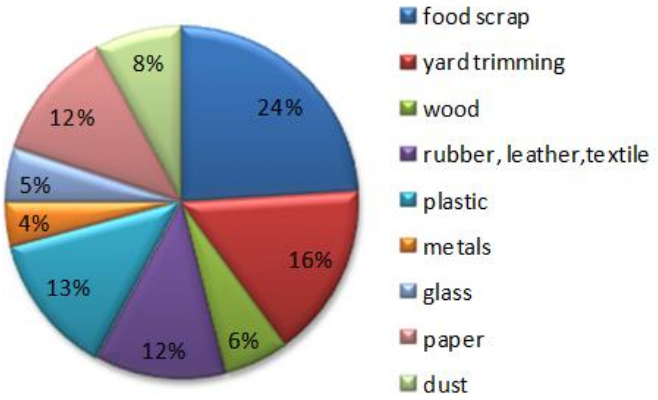
The percentage of wet weight of Solid waste material is called as moisture content. First of all categories of wastes are separated & 100gm of each category is taken for calculation of moisture content. From observations we can say that among all categories of waste, food waste containing maximum of 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:

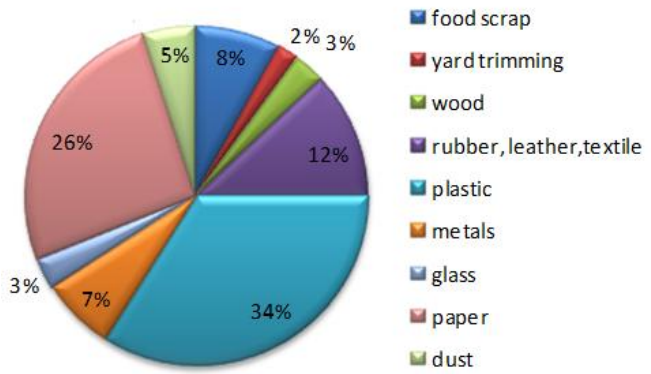
The temperature of waste is important characteristic of waste because the disposal facilities vary according to temperature; the high temperature waste can cause fire & smoke problems in landfills. The average temperature at the dump yard is found to be $29^{0,}$ average temperature at the domestic source is 27^{0} C & It is at commercial source is 26^{0} 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

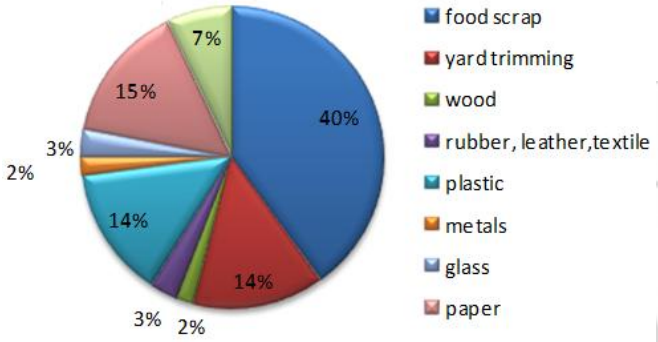
Solid waste management is one of the major environmental threats in front of world, the change in lifestyle of people, rapid development are responsible for large generation of waste, This waste is directly or indirectly causing problems to public health, drainage, cleanliness, beauty of the cities, 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.



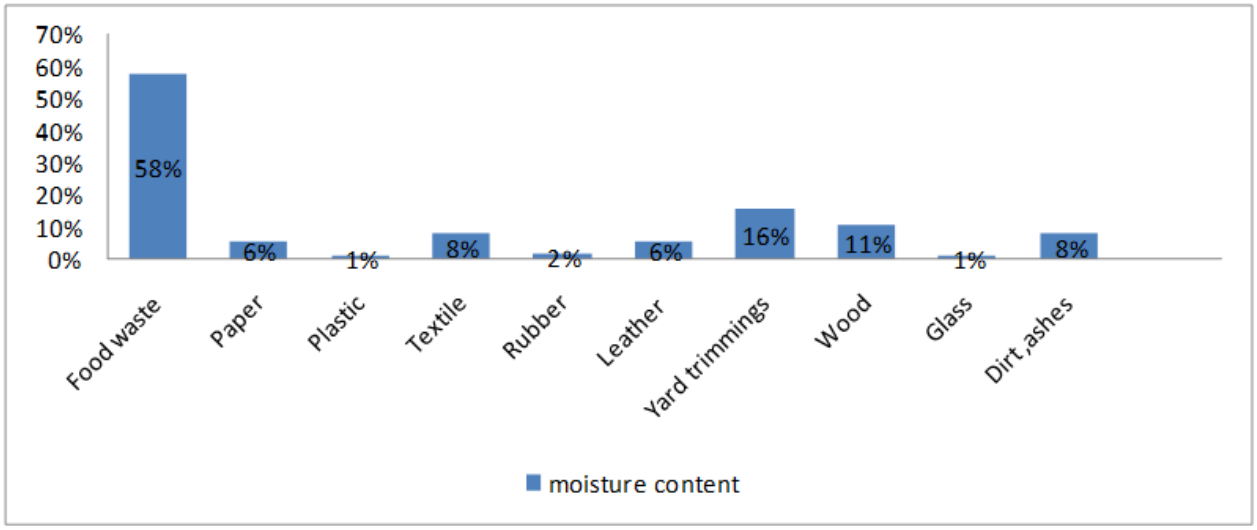
Graph No 01: Showing Composition of Waste from Sampling No 1 –At dumping yard (i.e. storage station)



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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References

[1] Solomon Cheru, Assessment Of Municipal Solid Waste Management Service In Dessie Town, Addis Ababa University, School Of Graduate Studies, June, 2011
[2] What a waste, solid waste management in Asia, Urban Development Sector Unit East Asia and Pacific Region May 1999
[3] World Health Organization Technical Report Series No. 484, Solid Waste Disposal & Control, Report Of W.H.O. Expert Committee.
[4] Solid Waste Management – India's Burning Issue By Ranjith Annepu | November 6, 2014 - 8:44 am | India, Solid Waste Management
[5] Asase, M., Yanful, E.K., Mensah, M., Stanford, J., Amponsah, S., 2009. Comparison of municipal solid waste management systems in Canada and Ghana: a case study of the cities of London, Ontario, and Kumasi, Ghana. Journal of Waste Management 29, 2779–2786.
[6] Sudha Goel, Municipal solid waste management (MSWM) in India-A critical review, Journal of Environ. Science & Engg.Vol.50,No.4,P.319-328,October 2008
[7] Santosh kumar Garg, Sewage Disposal & Air pollution Engg, Environmental Engineering Vol-2.
[8] Manual on Municipal Solid Waste Management, by the Ministry of Urban Development, Government of India, Expert Committee, February1998.
[9] Hazra, T., Goel, S., 2009. Solid waste management in Kolkata, India: practices and challenges. Journal of Waste Management 29, 470–478..
[10] Sanitary landfill, By Suman Ghosh, Mission Geoscience, Inc, Irvine, California 92612, U.S.A. & Syed E. Hasan, Department of Geoscience, University of Missouri-Kansans City, Missouri 64110-2499, U.S.A.
[11] Appropriate Design and Operation of Sanitary Landfills, Hans-Günter Ramke, Höxter Prepared for the International Conference on Sustainable Economic Development and Sound Resource Management in Central Asia By Professor Dr.-Ing. Hans-Günter Ramke University of Applied Sciences Ostwestfalen-Lippe, Campus HoexterAn der Wilhelmshöhe 44, D-37671 Hoexter, Phone ++49/5271/687-130, e-mail hans-guenter.ramke@hs-owl.de
[12] Landfill practice in India: A review, By SohailAyub and Afzal Husain KhanDepartment of Civil Engineering, A.M.U. Aligarh U.P. India & Department of Environmental Engineering, A.M.U. Aligarh U.P. India
[13] Decision Makers' Guideto, Municipal Solid Waste, Incineration,© 1999 The International Bank for Reconstruction and Development / THE WORLD BANK1818 H Street, N.W. Washington, D.C. 20433, U.S.A.
[14] Solid waste management challenges for cities in developing countries, Lilliana Abarca Guerrero a, Ger Maas a, William Hogland b, a- Built Environment Department, Eindhoven University of Technology, Den Dolech, 25612 AZ Eindhoven, The Netherlands b-School of Natural Sciences, Linnaeus University, SE-391 82 Kalmar, Sweden
[15] Status Report On Municipal Solid Waste Management, Central Pollution Control Board(Ministry Of Environment & Forests) Parivesh Bhawan, East Arjun Nagar, Delhi – 110 032
[16] Assessment of the status of municipal solid waste management in metro cities, state capitals, class I cities, and class II towns in India: An insight, Sunil Kumar [a],*, J.K. Bhattacharyya [a], A.N. Vaidya[a], Tapan Chakrabarti[a], Sukumar Devotta[a], A.B. Akolkar[b], National Environmental Engineering Research Institute (NEERI), Nehru Marg, Nagpur 440 020, India, Central Pollution Control Board (CPCB), New Delhi, India.
[17] Municipal solid waste management challenges and health risk problematic solutions at Agra city, U. P., India, By Abhimanyu Singh, Jamshed Zaidi, Divya Bajpai, Gunjan Sharma, Amita Yadav, Dheerendra S. Chauhan and Shree Ganesh Institute of Environment & Development Studies, Bundelkhand University, Jhansi, India.
[18] Manaf, L.A., Samah, M.A.A., Zukki, N.I.M., 2009. Municipal solid waste management in Malaysia: practices and challenges. Journal of Waste Management 29, 2902–2906.
[19] Sara/Bergqvist, S & Lisa/Wieslander, L. Waste management and health. A case study in Mbale, Uganda, Degree project in Public Health 10 poäng, Malmö University: Health and Society, Public Health department, 2006.
[20] A Case Study on Municipal Solid Waste Management in Chandan Nagar City S K Maity1, B K Bhattacharyay2, B Bhattacharyya3,1West Bengal University of Technology 2Department of Mechanical Engineering, Bengal Engineering and Science University, Shibpur, 3Department of Production Engineering, Jadavpur University, Corresponding Author: Swapan Kumar Maity
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[22] WWW.Wikipedia.com