



MUNICIPAL SOLID WASTE MANAGEMENT IN GHAZIPUR CITY- A CASE STUDY

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ABSTRACT

Status of the municipal solid waste (MSW) of Ghazipur city was studied. The results indicated that the organic waste was the highest among other components of the wastes. A considerable proportion of organic carbon was found which causes the health problem to the workers. In order to avoid this situation small community pots with revolving axis are needed along with the disposal vehicles, small auto rickshaws or paddle tricycles to maximize the collection of wastes. Annual report of the addition of the wastes due to increasing population and the strategies for collection of wastes shall have to be formulated.

Keywords: waste, management, Ghazipur, collection, categories.

INTRODUCTION

The most exhibited consequence of the population explosion is seen in the form of solid waste disposal problems. It is due to lack of proper evaluation of waste, its disposal sites, planning, policy making and enforcement of legislation. Solid waste of Municipal Corporation is diversified in nature and highly dependent on the type of area from where it has collected. About 200-500 gm/capita/day municipal solid waste has been generated. The urban population of 285 million is concentrated in a few large cities and 32 metropolitan cities are accounting for 34.5% of the urban population that is expected to reach 341 million by 2010 Lahti, V.M. and N. Jukka (2006). The waste quantities are estimated to increase from 46 million tones in 2001 to 65 million tones in 2010, Kumar and Gaikwad (2004). Characterization studies carried out by NEERI (1996) indicates that MSW contains large organic fraction (30-40%), ash and fine earth (30-40%), paper (3-6%) along with plastic, glass and metal (each less than 1%), calorific value of refuse ranges between 800-1000 kcal/kg and C/N ratio ranges between 20 and 30. The Ghazipur city is situated at the bank of river Ganga. It is an under developed district of Uttar Pradesh State and lying on both banks of River Ganga between 25° 19' North and 83° 4' and 83° 58' east with an area of about 3384 km². Climate of the Ghazipur is monsoonic, characterized by long and hot dry summer (March-June) Warm and Humid monsoon (July-October) and cold and dry winter (Nov-Feb.) seasons. As per record of the municipal corporation of Ghazipur city; population of Ghazipur city was around 75000-80000 thousand in Year 2004. The average quantity of solid waste generated in Ghazipur city is 205 gm/capita/day, the daily disposal

of the refuse was approx. 15-16 tons in year 2004. From previous time mode of disposal of municipal solid waste is still un-estimated way and in mixed form. This paper is an effort to present the segregated estimation of the different wastes, to highlight its resource recover and disposal recommendation prospects.

MATERIALS AND METHODS

The study area was divided in to four colonies; officers' colony, staff colony, mixed colony and labour colony represented by 1, 2, 3 and 4, respectively. The refuse collection performed by the help of refuse collector, in different months in April, August and December. In first complete round trip of the selected residents collection of the information regarding number of houses visited and number of residents in each has also been collected, the sorting of refuse performed at each 10 days and lay to eliminate moisture in open to take the dry weight. The categories chosen for the segregation were Food and foliage waste, Paper waste, Plastics, Glass, Metals, Fine earth and ash, others. The weighing has performed by normal balance of the capacity 5kg.

RESULTS AND DISCUSSION

Table-1 shows average of the refuse collected in different types and under different categories of residents. Table-2 shows percentage of the refuse released by Ghazipur city in year-2004. Figure-1 indicates the same information in graphical way.

**Table-1.** Fraction of the municipal solid waste in different colonies of Ghazipur city.

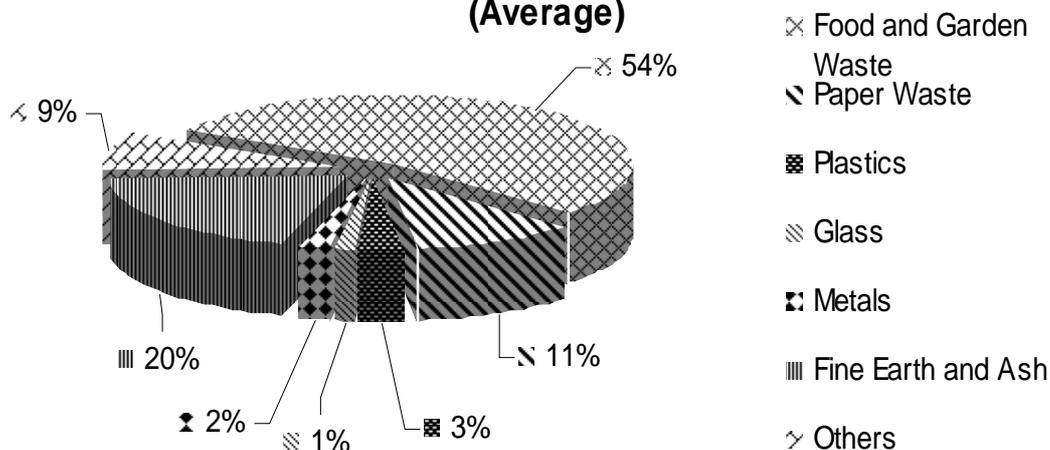
Refuse type	Weight (gm/capita/day)				Percentage by weight			
	1*	2**	3***	4****	1*	2**	3***	4****
Food and garden waste	187	139	89	60	65	59	55	43
Paper waste	40	25	14	11	14	11	9	8
Plastics	10	7	5	4.4	3	3	3	3
Glass	5	5	3	2	2	2	2	2
Metals	7	5	3	2.4	2	2	2	2
Fine earth and ash	23	36	28	44	8	15	17	32
Others	16	19	18	14	6	8	11	10
Total	288	236	160	137.8				

1. * Officers colony.
2. ** Staff colony.
3. *** Mixed colony.
4. **** Labour colony.

Table-2. Percentage of the refuse released by Ghazipur city in year-2004.

S. No.	Refuse type	Percentage
1.	Food and garden waste	43-65%
2.	Paper waste	8-14%
3.	Plastics	3%
4.	Glass	1-2%
5.	Metals	2%
6.	Fine earth and ash	8-32%
7.	Others	6-11%

Solid Waste Generated in Ghazipur City Year-2004 (Average)

**Figure-1.** Solid waste generated in Ghazipur city in the year 2004.



The collected data revealed that the highest proportion of the refuse caused by food and garden wastes, second highest was fine earth and ash while the third highest was paper waste. The highest food and foliage waste and paper waste was released by officers colony (category-1). The possible reason behind the higher release is the gardening and more paper work than other categories. Highest fine earth and ash was released by labour colony due to its uncemented surface and cooking on wood and coal. Plastic percentage was higher due to fashion of packed foods, while the glass and metals were nearly equal to all categories. The miscellaneous wastes were highest in mixed colony followed by labour colony. It was observed that Ghazipur city is releasing about 6-10 tones of organic waste daily. It may be a source of manure on proper composting either by microbial composting or vermicomposting. In this situation it is necessary to use small community containers with revolving axis to maximize the waste recovery and to avoid the double handling and health risk. Use of small vehicles for collection is more suitable to ensure the proper collection,

the pedal tricycles may be used as alternative for it. Annual report of the addition of the wastes due to increasing population and the strategies for collection of wastes shall have to be formulated. The implementation of these recommendations would result in solving the municipal solid waste problem of Ghazipur city.

REFERENCES

Lahti, V.M. and N. Jukka. 2006. Opportunities for finish environmental technology in India. In: Sitra report 63 Pub. Edita Prima Ltd., Helsinki. p. 74.

Kumar, S. and Gaikwad, S.A. 2004. Municipal Solid Waste Management in Indian Urban Centres: An Approach for Betterment. Urban Development Debates in the New Millennium, Edited by K.R. Gupta, Atlantic Publishers and Distributors, New Delhi. pp. 100-111.

NEERI Report. 1996. Strategy paper on Solid Waste Management in India. pp. 1-7.