

Analysis & Recycling of Municipal Solid Waste: A Case Study of Aurangabad City, Maharashtra, India

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Abstract: This study has analyzed the generation and characteristics of solid waste in Aurangabad city, along with the associated environmental impacts and existing solid waste management practices. Municipal solid waste management has become a serious problem because of rapid urbanization and improved economic activities. Planning for urban solid waste management requires an appraisal of many complex interactions among land use patterns, transportation systems, public health considerations, and urban growth and development. This paper contains the details about waste collection scheme, present status of solid waste management and sanitary landfill in Aurangabad city. The implementation of a sustainable municipal solid waste management in Aurangabad city along with environment friendly management of plastic waste should be taken up while encouraging people's participation as well. Results from this study shows that the imminent selection of dumping sites away from the city center due to unavailability of land and/or higher land price will induce three times as high daily waste transportation cost as compared to that at present.

I. INTRODUCTION

Aurangabad city is one of the major industrial centre in central Maharashtra. The variety of Industrial centers located includes five star at Shendra, Chikalthana, Waluj, Pandharpur and Paithan MIDC area. Due to urbanization and increase in population solid waste is major source of environmental pollution. Solid waste disposal poses a greater problem because it leads to land pollution if openly dumped, water pollution if dumped in low lands and air pollution if burnt. Aurangabad city is facing serious environmental degradation and public-health risk due to uncollected disposal of waste on streets and other public areas, clogged drainage system by indiscriminately dumped wastes and by contamination of water resources near uncontrolled dumping sites. This paper looks in brief at the current waste- generation, characteristics and management scenario in Aurangabad City, along with the associated environmental impacts.

Table 1: Solid Waste categories based on source

Source	Typical facilities, activities, or locations where wastes are generated	Types of Solid waste
Agricultural	Field and row crops, orchards, vineyards, dairies, feedlots, farms, etc	Spoiled food wastes, agricultural wastes, rubbish, and hazardous wastes
Industrial	Construction, fabrication, light and heavy manufacturing, refineries, chemical plants, power plants, demolition, etc.	Industrial process wastes, scrap materials, etc.; nonindustrial waste including food waste, rubbish, ashes, demolition and construction wastes, special wastes, and hazardous waste.
Commercial and Institutional	Stores, restaurants, markets, office buildings, hotels, auto repair shops,	Paper, cardboard, plastics, wood, food wastes, glass, metal wastes, ashes, special wastes, etc.
Municipal solid waste	Includes residential, commercial and institutions	Special waste, rubbish, general waste, paper, plastics, metals, food waste, etc.



Fig- Solid Waste in Aurangabad City

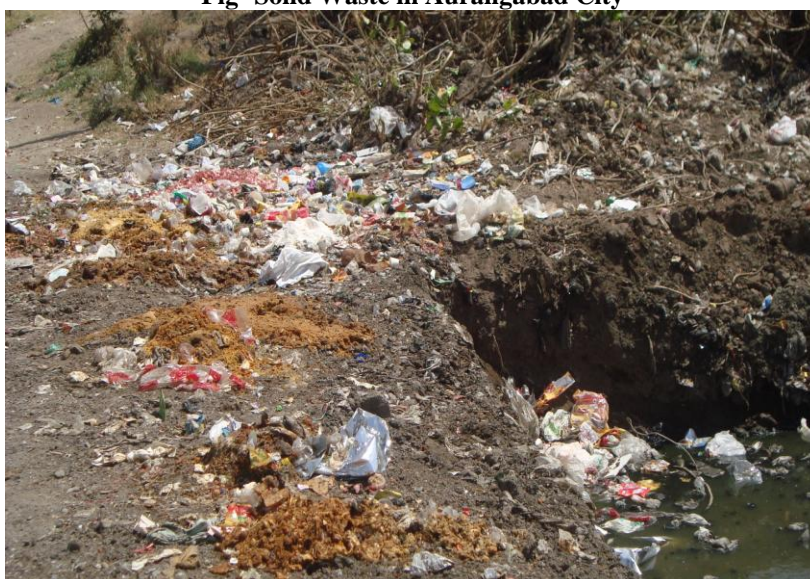


Fig- Solid Waste in Aurangabad City





Fig- Solid Waste Collection in Naregaon area, Aurangabad

Generation Of Municipal Solid Waste

1	Total MSW generation (MT/day) -	300 MT
2	MSW generation (gms/capita/day) -	300 gm
3	Of the total MSW generated	
	Quantity of domestic MSW (MT/day) - 130	130
	Quantity of commercial MSW (MT/day) - 90	90
	Quantity of industrial (non-toxic and nonhazardous) waste (MT/day) - 20	20
	Quantity of waste from markets (MT/day) - 20	20
	Quantity of waste from hotels and restaurants (MT/day) - 30	30
A)	Physical characteristics	
	Biodegradable 60%	60%
	Paper 3%	3%
	Plastic 2%	2%
	Glass 2%	2%
	Metal 15%	15%
	Inert, ash, debris	
	Building material 10%	10%
B)	Chemical characteristics	
	Moisture content 25%	25%
	Organic 35%	35%
	Other inert material 40%	40%

Collection, Storage And Transportation

1	Area covered for collection of MSW	138.2 sq. kms
2	No. of households covered	1,36,000
3	No. of households covered under door-to-door collection (bell ringing)-	1,36,000
4	Is the collection carried out by municipal authority or private contractor or NGO?	Municipality & Pvt. Agency in CIDCO
5	Is the segregation is carried out at source?	Yes
6	MSW collected in mixed form (MT/day) -	Mixed Waste
7	Frequency of waste collection -	Thrice in 24 hours

• Collection System

1	Approximate MSW collected (MT)	300 MT
	o Household (urban)	130 MT
	o Slums	30
	o Street sweeping	20
	o Shops & commercial establishments	30
	o Markets	20
	o Hotels, restaurants, eating houses	30
	o Gardens, parks, fairs	10
	o Slaughter houses	10
	o Building sites (debris, earth, etc.)	20
2	No. of premises / establishments	
	o Households	136000
	o Shops, commercial establishments	8375
	o Slums, households, population	110 slums, 2.35 Lac Population
	o Vegetable and fruit markets	75 Markets
	o Fish and meat markets	
	o Hawkers	1386
3	No. of hotels, restaurants, eating houses	
	o Grade / class I	
	o Grade / class II	1717
	o Grade / class III	
	o No. of star hotels	3 Star - 2, 4 Star - 2
4	Guesthouses	23
5	Marriage halls	88
6	Hostels	64
	Cinema halls	13
7	Theatres	3
8	Stables and no. of animals	276 (stables) / 5000 animals
9	Hospitals/ clinics/ nursing homes	1325
10	Parks, gardens, recreation places like lakes, amusement parks	85 Gardens (35 gardens from CIDCO area)
11	Building sites (under construction)	251 building sites

Processing And Disposal Of Msw

1	Total quantity of MSW processed (MT/day)	300 MT/D
2	Technology / technologies adopted	
	o Composting (MT/day)	120 - 150 MT/D
3	Composting	Manually
	Is it the compost sold	Yes
	The quantity sold (MT/year)	3.25 lacs in 2000
4	Dumping grounds/landfill sites	150 MT
	o No. of dumping grounds/ landfill sites	8 Hectares, 20 Acres of land at Naregaon is used
	o Distance (in km) of dumping ground / landfill site from	10 km from bus stand
	o Has it been designed scientifically	Yes Last 10 years

Institutional Arrangements

1	SWM services provided in the city/town by Aurangabad Municipal Corporation	Yes
2	Total no. of Supervisory Staff provided	
	(e.g. Health officer/ Assistant Health officer/ Chief	
	Sanitary Inspector/ sanitary Inspector/ Sanitary Supervisors, etc.)	48
3	Total no. of sweepers/ Pourakarmikas/ labourers/ Mukadam/ Jathedars/ Daffedars, etc.	1645

Community Initiatives for Solid Waste Management during Festivals & Religious Events



Stalls



Bags Given For Waste Collection



Waste is Collected in Segregation form



Collection transported for further process

II. CONCLUSION

- Industrial waste and domestic waste major sources of groundwater contamination were identified in the area.
- Increase the use of GIS and Remote sensing data to analyse solid waste & preparation of thematic maps.
- Environmental awareness programme must be implemented among the masses unto this last.
- The sites for solid waste dumping to be selected only after proper geohydrological investigation of area to avoid percolation of pollutants.
- Solid waste dumping must be kept away from Bore-wells & dugwells which generally tap deeper fractures & lineaments & cause groundwater pollution.
- Aurangabad Municipal Corporation is unable to offer the desired level of services with the existing capacity and trend of waste management due to fast increasing in population.
- Experts have suggested a community based solid waste management system involving recycling and composting in conjunction with sanitary land filling with possible provision for transfer station to account for long distance of landfill sites may be the possible way out of the current inefficient system. Thus it is realized that there is a need to take up a sustainable municipal solid waste management plan in Aurangabad city.
- Efforts should be made for the segregation and suitable processing and disposal and the possibilities of energy recovery from waste should also be explored. It is observed that, now few organizations, schools, and colleges are trying to spread the awareness about waste segregation by keeping dustbin of two colors one for dry waste and another one for wet waste and collecting solid waste during festivals.
- Major challenge with plastic waste management is that different types of plastic wastes are mixed, which is very difficult to separate, Secondly, plastic sachets with metallic layer are very common nowadays, which are a major challenge to deal with. So, an environment friendly plastic waste management plan must also be implemented forthwith.

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REFERENCES

- [1]. Sharma, S., Shah, K.W., (2005), 'Generation and disposal of solid waste in Hoshangabad', In: Book of Proceedings of the Second International Congress of Chemistry and Environment, Indore, India, pp. 749–751.

- [2]. Shekdar, A. V., Krshnawamy, K. N., Tikekar, V. G., Bhide, A. D., (1992), 'Indian urban solid waste management systems – jaded systems in need of resource augmentation. *Journal of Waste Management* 12 (4), 379–387.
- [3]. Rathi, S., (2006). Alternative approaches for better municipal solid waste management in Mumbai, India. *Journal of Waste Management* 26 (10), 1192–1200.
- [4]. Sharholly, M., Ahmad, K., Mahmood, G., Trivedi, R. C., (2005) 'Analysis of municipal solid waste management systems in Delhi' – a review. In: *Book of Proceedings for the second International Congress of Chemistry and Environment*, Indore, India, pp. 773–777.
- [6]. Ray, M. R., Roychoudhury, S., Mukherjee, G., Roy, S., Lahiri, T., (2005), 'Respiratory and general health impairments of workers employed in a municipal solid waste disposal at open landfill site in Delhi', *International Journal of Hygiene and Environmental Health* 108 (4), 255–262.
- [7]. Jha, M. K., Sondhi, O. A. K., Pansare, M., (2003), 'Solid waste management – a case study', *Indian Journal of Environmental Protection* 23 (10), 1153–1160.
- [8]. Kansal, A., (2002) 'Solid waste management strategies for India', *Indian Journal of Environmental Protection* 22 (4), 444–448.