

Assessment of Municipal Solid Waste in Kalaburagi City: Quantity, Characteristics and its Operational Efficiency

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Abstract

Developing country like India has drastic changes in population growth and which leads to urbanization and this results demand on basic needs. Public migrating from villages to town for fulfills their needs and demands. Changing life style may result in increasing waste generation rates in cities. Municipal Solid Waste (MSW) management has become a serious problem in recent days due to a large quantity of waste generation. Kalaburagi city generates municipal solid waste for about 197 tons per day (TPD) and the collection is about 132 TPD. The efficiency of waste collection in city is found approximately 82.30 per cent. Selected sampling samples were segregated and weighed, there was 59.3 per cent of organic waste produced and remaining 33.3 per cent waste has been recyclable wastes, which includes paper, plastic, glass, metals and remaining 7.4 per cent was other waste which includes ashes, soil residues and debris. Treatment of segregation is not done at source level as well as dumping site. Improper management and lack of waste handling knowledge will cause environmental effects in its surrounding. Improvement process of municipal solid waste for scientific treatment and skilled practices is to be needed.

Keywords: Debris, organic waste, recycles; segregate, solid waste collection, treatment.

INTRODUCTION:

Waste generation in urban areas, multiplies in its quantities and major challenging effort to its handling for urban local bodies (ULB's). Wastes in urban cities were largely responsible for population explosion and migration of people from villages, these may generate thousands of tons of municipal waste daily. Rapid increase with population along with expansion of urban areas and living style may cause adverse effect to inhabitants of environment (Choudhury and Choudhury, 2014). Most of the cities were failed to establish centralized composting units because of larger quantities of waste generation (Pavan and Balakrishna, 2014). In most of the developing cities, municipal solid waste disposal causes chronic diseases, especially in a high dense populated cities (Karak, *et al.*, 2012).

The management of MSW at the State Committee and Pollution Control Board, which includes efficient segregation of solid waste into biodegradable, Non-biodegradable and domestic hazardous waste are stored in colour coded bins at the source of its generation (Naveen, *et al.*, 2014). MSW is going through a critical phase, due to larger amount of waste generation daily and unavailability of facilities of scientific treatment and processing in cities. In Indian cities more than 25 per cent of waste is not collected and about 70 per cent of cities lacking are transportation facilities (NEAC, 2007). Urban solid waste in Indian cities has low calorific value and high moisture content (Bhattacharayya, 1997). Unscientific disposal of waste causes adverse impact on all environmental factors includes human health (Rathi, 2006; Gupta *et al.*, 1998) and open dumping waste disposal (Rajkumar, *et al.*, 2010) which may lead to cause ground water contamination. Himalayan state found various health problem issues due to increase in total quantities of wastes (Goel, 2008). Improper management of municipal waste handling will cause an adverse impact of the surrounding environmental components (Singh and Singh, 1998).

STUDY AREA:

Kalaburagi city is well known historical background and monuments built by Bahamani kings. Kalaburagi was earlier known as "*Kalburgi*" and also "*Gulbarga*". The word *Kalburgi* means stone land in Kannada. Kalaburagi city is famous for many historical places, architecture, monuments and religious and also well administrative setup. City has been large commercial hub in Hyderabad – Karnataka Region. Kalaburagi city is growing wider in an around city by migration of public for facilities like education, transportation, business, daily wages and employment purposes. The waste management is managed by Kalaburagi Municipal Corporation and Kalaburagi Urban Development Authority (KUDA).

Kalaburagi city is geographically located at 17° 20'N, 76° 44'E, largely composed with Deccan trap and with an average elevation 457.50 meters from the mean sea level. The city climate is generally dry and the temperature ranges from 8°C to 45°C, annual rain fall found about 750 mm. According to 2011 census, the estimated

population of the Kalaburagi city was 5, 43,147 and the city covers an area of 64 square kms.

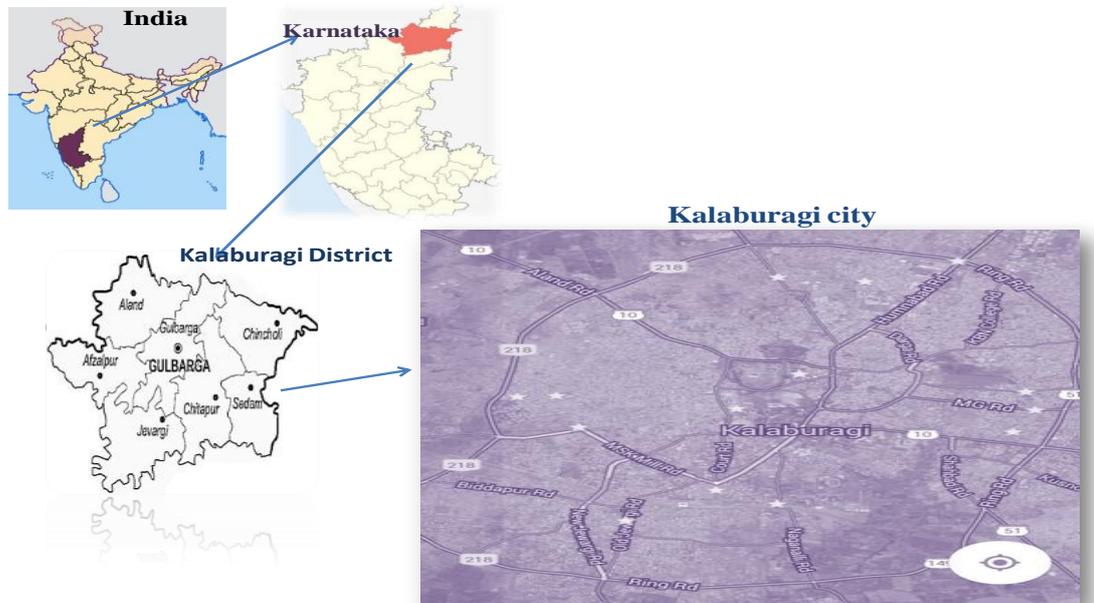


Fig: 1. Kalaburagi City Map.

MATERIALS AND METHODS:

The present study of municipal solid waste, the quantity of municipal waste generation in study area, operational efficiency towards waste generation around city and its characteristic were studied. Quantity of municipal waste was calculated by using secondary data generated of Municipal Corporation. Kalaburagi city was distributed into 55 wards for administrative development purposes. Kalaburagi City Corporation is working towards developing sound on municipal waste management. The primary data of waste collections process from sampling stations were randomly selected and reducing by 1/4th of actual size, in those 14 sampling locations were identified randomly in covering all direction of city. These sites were pointed through geo-references with GPS. Municipal solid waste samples were measured by manual sampling of 10 kg capacity recyclable polythene bag, hand gloves, mask and electronic weigh balance.

Assessment of efficiency towards municipal solid wastes in a study area was studied by conducting field survey and direct communication by municipal authorities.

RESULTS AND DISCUSSION:

Quantity of Waste Generation:

The amount of municipal solid waste generated in the city were largely increased due to population explosion. Quantities of waste generation were estimated by conducting

survey around city and sources of waste generation. Waste generation in and around city has been estimated and total of municipal waste produce is 197 TPD.

Table: 1. Quantity of waste generation.

Sl. No	Sources of waste	No. of Waste Generators	Avg. waste per source (kgs/day)	Total waste (tons/day)
1.	Household	102830	1.2	123.40
2.	Commercial Shops	14861	1.6	23.78
3.	Hospitals (MSW)	514	5.1	2.62
4.	Small hotels	530	4.1	2.17
5.	Large Hotels	53	11	0.58
6.	Markets (major)	15	1230	18.45
7.	Street sweepings			
	A type roads in Kms	202.47	29	5.87
	B type roads n Kms	645.31	9.1	5.87
	C type roads in Kms	138.78	4.1	0.57
8.	Educational Institutes	682	6.4	4.36
9.	Miscellaneous waste	5%		9.38
Total waste generated in City				197.06

Source: Kalaburagi City Corporation, 2014.

Operational Efficiency of MSWM:

Solid waste management is very essential to control over generation. The efficiency towards solid waste collection, transportation and its process is managed by City Corporation. At present condition, collection of waste at Door to door is about 60 per cent in all wards by using sweeping carts, hand carts, auto trippers and four wheeler jeeps. About 102830 households are generating MSW everyday and an average waste generation is about 1.2kg/day (Table 1). The individual household peoples were not practiced about municipal solid waste segregation at source level. Average MSW generation in Kalaburagi city was about 362 grams per day per capita. The collection and transportation of MSW also not have done any segregation process. City generates 197 TPD and collection of waste is approximately 132 TPD and efficiency of collection is 66 per cent.

Total amount of solid waste at Kharagpur municipality was about 95 metric tons/day but out of which 50 metric tons of waste is collected and remaining 40 metric tons waste is uncollected(Kumar & Goel, 2009).

Transportation of municipal waste is carried out with using vehicles such as tractors, trucks, dumper placers and compactors. Apart from these compactor vehicle is much efficient towards transport municipal wastes with closed manner and it is free from offensive odour to carry wastes to dumping site.

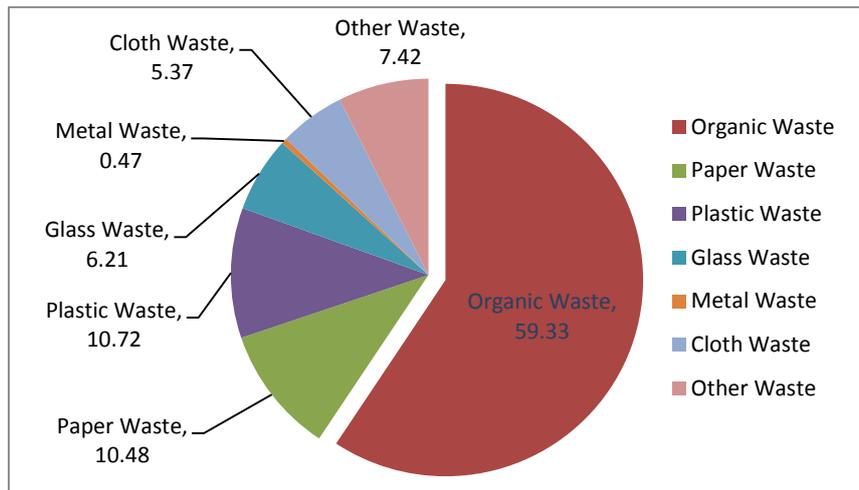


Fig: 2. Diagram of Physical characteristics of Municipal Waste during 2014-15.

CONCLUSION:

Municipal Solid Waste Management is challenging issue for consulting authorities due to drastic change in population due to migration. The present study provides knowledge towards quantity and characteristics of waste generation in study area. Waste generation and collection were studied and collection efficiency is found for about 66 per cent. Organic waste is much higher than other wastes, which is easily degradable but municipal waste is largely composed with mixed waste in its generation. Nobody does the waste segregation at source level itself. As waste segregation at source is the thumb rule of MSWM. Transportation facility is quite good to carry waste to dumping site using compactor vehicle. The lack of waste treatment and scientific as well s skilled man power is needed to process the waste at dumping site.

REFERENCES:

- [1] Bhatatacharayya A. K. (1997): Solid Waste Management, Yojana Dev. Environ. 110:4.
- [2] Choudhury, M. and Choudhury, M. (2014): Trends of Urban Solid Waste Management in Agartala City, Tripura, India, Universal Journal of Environmental Res. and Tech., 4: 227-235.
- [3] Goel, S. (2008): Municipal Solid Waste Management in India: a critical review. Environmental Sci. and Engg., 50 (4): 319-328.
- [4] Gupta, S., Krishna, M., Prasad, R. K., Gupta, S. and Kansal, A. (1998): Solid waste management in India: options and opportunities. Resources, Conservation and Recycling, 24: 137-154.
- [5] Karak, T., Bhagat, R. M. and Bhattacharyya, P. (2012): Municipal solid waste generation, composition and management: The world scenario. Critical Rev. Environmental Sci. and Tech., 42(15): 1509-1630.

- [6] Kumar, K. N., & Goel, S. (2009). Characterization of Municipal Solid Waste (MSW) and a proposed management plan for Kharagpur, West Bengal, India. *Resources, Conservation and Recycling*, 53(3), 166–174.
- [7] Naveen, B P , Sivapullaiah, P.V, Sitharam, T. . (2014). Characteristics of a Municipal Solid Waste Landfill.
- [8] National Environment Awareness Campaign, (2006-07): Prakriti, Centre for Management Studies, Dibrugarh University, Assam, India.
- [9] Pavan and Balakrishna. H. B., (2014): Decentralized composting of Municipal Solid Waste in Bengaluru City- An overview, *Int. J. Res. in Engg. and Tech.*, 3: 260-263.
- [10] Rajkumar, N., Subramani, T and Elango, L. (2010): Ground water contamination due to municipal solid waste disposal – A GIS based study in erode city. *Int. J. Environ. Sci.*, 1:39-55.
- [11] Rathi, S. (2006): Alternative approaches for better municipal solid waste management in Mumbai, India. *Journal of Waste Management* 26 (10), 1192-1200.
- [12] Singh, S. K. and Singh, R. S. (1998). *Indian Journal of Environmental Protection* 18(11): 850-852.

