

Original Paper

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## **Solid Waste Management Survey in Kankaria Lake, Ahmedabad**

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### **Abstract**

Municipal solid waste management is one of the major environmental problems of Indian cities. Improper management of municipal solid waste (MSW) causes hazards to the inhabitants. Various studies reveal that 90% of MSW is disposed of unscientifically in open dumps and landfills, creating problems in public health and the environment. The Kankaria Lake is a well-known place in Ahmedabad. This paper presents an assessment of the existing situation of municipal solid waste management in Kankaria. Zoo, Butterfly-garden, Kids park and Nagina Vadi are comprised in this research. Every aspect of solid waste management related to the Kankaria Lake is covered in this paper.

Keywords: Solid waste management, Kankaria-lake, Zoo.

### **Introduction**

Rapid population growth, urbanization and industrial growth have led to severe waste management problems in the cities of developing countries like India. India is an agriculturally based country

with a present population of approximately 1.2 billion (Union Health Ministry, 2011). According to the provisional figures of Census of India 2011, 377 million people live in the urban areas of the country. This is 31.16 % of the Country's total population. There are 29 states and seven union territories in the country. India has led to the migration of people from villages to cities, which generate thousands of tons of MSW daily. The Municipal solid waste (MSW) amount is expected to increase significantly in the near future as the country strives to attain an industrialized nation status by the year 2020 (Sharma and Shah, 2005; CPCB, 2004; Shekdar *et al.*, 1992). Poor collection and inadequate transportation are responsible for the accumulation of MSW at every nook and corner. The management of MSW is going through a critical phase, due to the unavailability of suitable facilities to treat and dispose of the larger amount of MSW generated in metropolitan cities. Unscientific disposal causes an adverse impact on all components of the environment and human health (Rathi, 2006; Sharholyet *al.*, 2005; Ray *et al.*, 2005; Jha *et al.*, 2003; Kansal, 2002; Kansalet *al.*, 1998; Singh and Singh, 1998; Gupta *et al.*, 1998).

Generally, MSW is disposed in low-lying areas without taking any precautions or operational controls. Therefore, MSWM is one of the major environmental problems of Indian Megacities. It involves activities associated with generation, storage, collection, transfer and transport, processing and disposal of solid wastes. But in most cities, the MSWM system comprises of only four activities, i.e., waste generation, collection, transportation, and disposal. The management of MSW requires proper infrastructure, maintenance and upgradation of all activities. This becomes increasingly expensive and complex due to the continuous and unplanned growth of urban centers. The difficulties in providing the desired level of public service in the urban centers are often attributed to the poor financial status of the managing municipal corporations (Moret *al.*, 2006; Siddiquiet *al.*, 2006; Rajeet *al.*, 2001; MoEF, 2000; Ahsan, 1999). During the last three decades, the National Environmental Engineering Research Institute (NEERI) has carried out studies in more than 50 cities and towns in India. Characterization of MSW indicated that the waste consists of 30-45% organic matter, 6-10% recyclable and the rest as inert matter. The organic matter in solid waste in developing countries is much higher than that in the developed countries (Bhide and Sundersan, 1983), and organic matter can be converted into useful products to reduce the burden on existing landfills (Richard, 1992). The MSW (Management and Handling) Rules, 2000 recommend source-

specific waste collection and transportation in addition to appropriate processing and disposal. In this paper, it is shown that how much of solid waste is generated from the Kankaria-Lake.

### **Methodology**

Survey based methodology is adopted for the present study.

### **Result and Discussion**

In Kankaria most of the waste is organic matter as it is surrounded by so many trees. The paper and plastic waste is in lower amounts than leaves and sticks. The cleaning of Kankaria starts at night around 8.00 pm. everyday. There are total 64 to 68 sweepers are working under the Ahmedabad Municipal Corporation. All of them are hired by a private company to take care of the Kankaria-lake. This cleaning ends at 5.00 am. in the next day morning. There are three shifts, morning, evening and night for cleaning and disposing the solid waste from whole place. It consists the waste from the Zoo, Food-Stalls, Kids-Park, Periphery, Butterfly Park and surrounding of the walls of Kankaria.

In the Kamla Nehru Zoological Garden, the waste is utilized in making manure for plants. Zoo generates a very less amount of paper and plastic waste. In manure plant 600 ml of microbial liquid and 200 liter of water is used for making the manure. All the waste is mixed with microbial liquid and water very well in the rotator. After rotating this mixture, it is placed for aerobic process near by area. After 15 days this mixture is screened on the vertical screening machine. After the screening the larger parts are used again for aerobic process and the screened small particles are collected in the big bag. This manure production plant used 100 m<sup>2</sup> of land for manure production. This process require 75 kWh of electricity. The manure plant is near the gate of the zoo and it produces more than 1000 kg manure in 3-4 days. This manure is sent to the Ahmedabad Urban Development Authority (AUDA) gardens in the Ahmedabad city for using it as fertilizer for plants.

Plastic and paper waste are send to the industries for recycling once in a week. The workers from industries come to Kankaria to collect the plastic bottles. They segregate them and then carry these bottles to plastic recycling industry. The food waste is collected in different blue coloured bags. They are kept separate for disposal. Whatever the green waste is generated/collected from the periphery of the Kankaria-lake is sent to small part called bore well station in the Kankaria.

Workers use the sticks as wood-fuel for cooking and other purpose, who live there, and the rest of the plant leaves and sticks are sent to compost making industries.

The Kankaria Lake area generates 7000 kg to 8000 kg of solid waste on a daily basis. The amount increases when it is a national holiday and on weekend days. It increases up to 12000 kg to 14000 kg during holidays. All the leftover solid waste is disposed to the outside of Kankaria which is later collected by AMC trucks and transported to Pirana, the dumping site of Ahmedabad city.

Name of Holidays and numbers of Public entry at Kankaria as follows: Rakshabandhan – 38974, Independence Day - 53168, Janmashtami – 8093, Diwali – 54000, Hindu New year – 68000, Bhaiduj – 77000. As per the record of the Kankaria lake administration, these are the entries of people on Sundays and national holidays for the month of August to November 2017.

#### AVERAGE TOTAL SOLID WASTE GENERATION ON PUBLIC HOLIDAYS

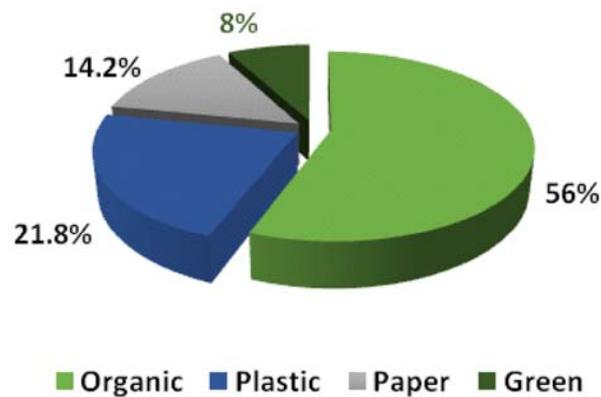


Figure shows percentage of waste generated during holidays.

#### Conclusion

Solid waste management is a big challenge in bigger cities nowadays. As the research has done in Kankaria, it really looks very difficult to manage all the prospects related to waste management. Some places lacks advanced equipment and modern ideology.

The disturbing thing which was found in every part of research is lack of awareness in the public. We the people of Ahmedabad or as citizens of India need to be aware of this situation first. We must understand the growing problem of waste disposal. We must propagate the recyclable/reusable things in first demand. We must stop using plastic bags at a certain point. Awareness is the only way to better and sustainable future.

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