

## Managing Waste in Kota

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### ABSTRACT

*Knowing it fully well that waste is going to be a great danger in future if not managed properly. Various types of wastes produced by the society is dumped on the roads or in water reservoirs. Another alarming fact is that only about fifty percent is subjected to some sort of treatment. This result in severe pollution of land, air and water and causes severe health problems. The increased incidence of epidemics is a pointer for this situation. Moreover, irreparable damage is being caused to the ecosystem and therefore, a safe dependable waste management and disposal system is the need of the hour.*

*The paper stresses the use of 4Rs in minimizing the waste and the techniques related to manage the waste have been discussed at length.*

Key words: Waste Minimization, Waste Management, Hazardous waste, Heavy use, Recycle, Recover, Reduce.

### INTRODUCTION

Environmental pollution has been receiving more and more attention in recent years. The pollution of the land surfaces has been neglected until recent years and only since the mid sixties, with the passage of the Solid Waste Disposal Act (1965), has concerted action been taken to control and prevent land pollution.

A waste is defined as any waste or mix of waste of renewable in nature arising from Urban, Municipal and Industrial Sectors. The solid waste includes human excreta, household waste, city garbage, commercial waste and industrial waste. Due to improper waste management facilities and treatment, these wastes find their way into the environment. Problem of waste could be mitigated through adoption of improved and scientific methods and environment friendly technologies for collection, treatment/processing before it is disposed off.

The management of solid waste is one of the essential services and it is an obligatory duty of municipal bodies to arrange for daily street cleaning and transport, processing and disposal of waste in the urban areas. In spite of being responsible for provision of SWM services, the urban local bodies generally fail to make adequate provision for the primary collection, transportation and disposal of waste in an environmentally acceptable manner. In most urban areas the management of urban waste is looked at as an inferior function fit to be supervised only by the lower level officers. The people at the helm of affairs do not consider SWM as a priority area though very large percentage of funds of the urban local body is spent towards this most essential service. The apathy of the decision-makers and urban planners is thus primarily responsible for the poor level of SWM services inclusive of knowledge about the hazardous waste in urban areas.

In order to fulfill the objectives to identify the various types of solid waste and their sources, to examine the physical and chemical composition of waste and to consider in general terms the elements involved in the management of these waste present study was made.

The first objective of solid waste management is to remove discarded materials from inhabited places in a timely manner to prevent the spread of diseases, to minimize the likelihood of fires, and to reduce aesthetic insults arising from putrefying organic matter. The second objective, which is equally important, is to dispose of the discarded materials in a manner that is environmentally acceptable.

In designing a solid waste collection system, one of the first decisions to be made is where the waste will be picked up; the curb or the backyard. Another key decision is frequency of collection. Both point of collection and frequency of collection should be evaluated in terms of their impact on collection

costs. Systems with once-a-week curbside collection help maximize labour productivity and result in significantly lower costs than systems with more frequent collection and or backyard pickup.

The choice of solid waste storage containers must be evaluated in terms of both environmental effects and costs. For example, paper and plastic bags are superior to many other containers from a health and aesthetic standpoint and can increase productivity when used in conjunction with curbside collection. However with backyard collection systems, bags have little effect on productivity.

## REVIEW OF LITERATURE

The history of solid waste management is largely connected with the histories of the larger cities. Not much record is available on the problem related to solid waste management.

In reviewing the book entitled, “The Disposal of Municipal Refuse” by H.de B. Parsons (1906), we note that many of the basic principles and methods underlying what is known today as the field of solid waste management, are not new and were well known even then. Parsons described various methods for the disposal of solid waste.

W.A. Hardenbergh (1928) in his book, “Municipal Sanitation”, described the functional element of collection of solid waste. B.B. Jones and F. Owen, 1934, in “Some Notes on the Scientific Aspects of Controlled Tipping”, described solid waste management with emphasis on controlled tipping (now known as “sanitary landfilling”).

Inefficient and improper methods of disposal of solid waste result in scenic blights, create serious hazards to public health, including pollution of air and water resources, accident hazards and an increase in rodent and insect vectors of disease. The failure to salvage and reuse such materials economically results in the unnecessary waste and depletion of natural resources.

J.J. Priestley in 1968 published a book entitled, “Civilization, Water and Waste, Chemistry and Industry”, which revealed that during the flourishing of the Minoan civilization on crete from 3000 to 1000 BC, solid waste in the capital of Knossos were placed in large pits with layers of earth at interval. This practice was said to have persisted until the 19<sup>th</sup> Century.

Many others have done work on recycling and recovery of solid waste. Some of them are Charles I. Harding (1967); N.L. Drobny, H.E. Hull, R.F. Testin (1971); M. Belknap (1972); D. Bendersky, W.R. Park, L.J. Shannon, W.E. Franklin (1972) and H. Ness (1972).

American Public Works Association (1975), Institute for solid waste published a book entitled, “Solid Waste Collection Practice” to describe various principal methods of financing solid waste management system.

Solid waste management in India is an emerging and engaging area of study. However the picture is often confusing and solution fuzzy as information available in public domain is either scanty or scattered.

A study conducted by the CPCB in 2000 on management of municipal solid waste in the country estimated that waste generation from the present 48 million tones is expected to increase to 300 million tonnes per year by the year2047 (490 g per capita to 945 g per capita). The estimated requirement of land for disposal would be 169.6 sq km in 2047 as against 20.2 sq km in 1997.

Since solid waste reflect the life-style of the generating populace, the character and amount of various components in the solid waste stream will vary from locale to locale in Kota city.

### **MATERIALS AND METHODS**

Kota is an important city in the state of Rajasthan. Here the option for disposal of municipal and other waste is limited in variety and in number. The collection of garbage from different collecting spots is a part of methodology for knowing about the present and projected impacts of solid waste disposal. The garbage was collected, separated – biodegradable and non-biodegradable, weighed for sampling and analysed about the contents which may not damage the society/ environment.

It was estimated that what type of chemicals/ contaminants are present in the samples collected from various sites [Kachchi Udiya Basti, Sanjay Nagar, Talwandi, Mahaveer Nagar, Talwandi (P) and Vallabh Nagar] belonging to slum to posh habitats. Components that typically make most municipal solid waste are selected because they are readily identifiable and consistent with component categories. These are Paper, Polythene, Vegetables/ Fruits, Dust, Plant, Cloth, Glass, Plastic and Metal.

During the course of study restaurants, parks, temples, ice-cream parlour, mess, dairies, hostels and hospitals located in selected colonies were also visited and their waste management techniques were discussed. Stray animals in each locality were also counted to have a general idea about their number.

Views of the people regarding their household waste and their awareness about the rising problem of solid waste were also studied through a questionnaire.

### **RESULT AND DISCUSSION**

Waste generation survey revealed that quantity of waste generated is influenced by many factors such as season of the year, frequency of collection, the habits and the economic status of the people and public attitude.

It was observed that the economic status of the people influenced the quantity of solid waste generated. Higher the income of the people more was the waste generated by them (TABLE 1). The vegetables/ fruits waste was relatively higher than the other waste categories (TABLE 2). The waste of paper, polythene, vegetables/ fruits and dust increased considerably with the income group but the waste of plants, cloth, glass, plastics and tin were either not found or found to a very small extent in the low income group.

**TABLE 1: Total and Average waste (in gms) per day per person per house in various locations**

<b>Location</b>	<b>Total no. of person</b>	<b>Total waste per day (in gms)</b>	<b>Average waste per person per day (in gms)</b>	<b>Average waste per house (in gms)</b>
Kachchi Udiya Basti	232	1177.50	5.08	23.55
Sanjay Nagar	322	1503.00	4.68	30.06
Talwandi	254	11692.50	46.03	233.85
Mahaveer Nagar	245	12115.50	49.45	242.31
Talwandi (P)	247	22269.00	90.16	445.38
Vallabh Nagar	234	22111.00	94.49	442.22

**TABLE 2: Season wise Mean Daily Individual waste (in gms)**

Waste	Summer	Monsoon	Winter
Paper	22.82	29.80	27.07
Polythene	23.03	27.73	26.26
Vegetables/ Fruits	802.20	863.12	924.39
Dust	22.85	26.84	27.06
Plant	4.85	4.28	3.32
Cloth	0.10	0.39	0.28
Glass	0.06	0.18	0.07
Plastic	0.01	0.05	0.04
Metal	*	0.03	0.10
SE m±	90.46	99.40	105.48
C D at 5%	258.57	284.11	301.49

Considerable increase in the generation of waste was found during the months of October and November due to Diwali festival in the colonies of high income and middle income group but this increase was not reflected considerably in the low income group.

In all 46 different questions related to individual behavior and habits were asked from the member of 100 families. It helped in finding out the different types of waste generated in Kota and the reasons contributing to it.

Reduction of waste at source, although not controlled by solid waste managers, is now included in system evaluation as a method of limiting the quantity of waste generated. Ultimately, significant reductions in the quantities of solid waste that are generated will occur when and if people are willing to change – on their own volition – their habits and lifestyles to conserve national resources and to reduce the economic burden associated with the management of solid waste.

Solid waste management is one such activity, where public participation is key to success. The local body can never be successful in solid waste management without active community participation, whatever may be the investments made from the municipal or government funds. The local bodies are the institutions of grass root democracy having elected members representing a small group of electorate. It also has an outreach service at the ward level through which it can easily interact with the people on almost all important issues. The local body should therefore, seriously consider involving community in all programmes through a consultative process and variety of other communication approaches.

Public awareness, effective community participation, transparent and clean administration, introduction of citizen charters and accountability at all levels can only bridge this gap.

### **NEED FOR ACTION**

This is high time when each and every individual of Kota City should understand the value of cleanliness in the interest of fellow citizens. The management of solid waste has become one of the essential services and it is an obligatory duty of municipal bodies to arrange for daily street cleaning and transport, processing and disposal of waste in the urban areas.

Without adequate data on population, waste production and political conditions, it is not feasible to attempt the formulation of any sort of scheme or plan for systematic waste collection and disposal or

recycling. An action plan will be needed to curb waste and for perfect waste management practices. Need to take stern action at all the levels have been the need of the hour.

### **SIGNIFICANCE IN NATIONAL INTEREST**

Waste disposal is one of the major problems being faced by all nations across the globe. Major portion of collected waste is dumped in landfill sites. The recyclable content of waste ranges from about 13% to 20%. In a developing country like India, paper, plastic, glass, rubber, ferrous and non-ferrous metals – all the materials that can be recycled are salvaged from this waste to produce low cost products extensively used by the lower-income groups of the society. The uncollected waste that usually finds its way in sewers is eaten by the cattle or left to rot in open or burnt on roadsides.

A faster rate of conversion of waste into wealth, energy, health and compost will be in the interest of the nation.

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