



## WATER, ENVIRONMENT AND MANAGEMENT

### Solid waste management - Indian scenario

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#### INTRODUCTION

Public Health and Sanitation are State subjects. The responsibility of environmental improvement including collection and disposal of Solid Waste in urban areas is entrusted to the Urban Local Bodies (ULBs). In most of the cities and towns, at present public-cleansing services are inadequate and unsatisfactory. Rapid growth of industries, services and associated urbanisation being the key features of this urban scenario. Lack of financial resources, inadequate trained manpower, fragmentation of administrative responsibility, non-involvement and lack of awareness of the community are the major constraints of Solid Waste Management (SWM) activity.

Poverty and low standards of living in slum areas have an adverse effect on the sanitary conditions that prevail in cities and towns. Investment on SWM at present in Indian cities varies from US\$ 2.5 to 4.5 per head per annum.

#### URBAN GROWTH

The urban share of population of India is expected to grow from 23% to 32% over the period 1991-2001. Half of the population growth will be urban over this period and the urban population will be more than double with an increase of 117 million. The urban population at the end of the century is estimated around 300 million. These demographic and industrial trends are now leading to environmental problems of major dimensions in cities and towns.

In the country, Class-I (Population above 1,00,000) and Class-II (Population 50,000 - 99,999) urban units together totalling 645 out of 3,768 contribute about 88% of the total urban population during 1981-91, the remaining 3,123 urban settlements sharing 12% population only. The country points to a travel towards excessive dominance of Class-I and Class-II cities in urban system of the country which obviously will have an adverse impact on environment of these cities.

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Exchange Rate - US \$ 1 = INR 25 (Approx.)  
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#### SECTOR ADMINISTRATION

##### Role of Government of India

The role of the Ministry of Urban Development, Government of India is largely limited to advising the Urban Local Bodies (ULBs), supporting Research and Development and providing technical assistance to the State and Urban Local Bodies. The Working Group on Urban Development for the Eighth Five Year Plan (1992-97) has recommended inclusion of centrally sponsored sanitation programme, which includes solid waste management as well. The Eighth Five Year Plan proposals are yet to be finalised.

##### Role of the State Government

The role of the State Government is very limited as the funds for urban services are also to be raised by the local body. However, due to weak financial health of the local bodies, the State Government has been extending grant assistance both for capital assets and maintenance. Such grant assistance vary from 10% to 30%.

##### City Administration

The Management of wastes generated within the city is the responsibility of the local authority. For the purpose of the administration of urban areas the State Governments set up such authority under the law promulgated by the State Legislature. The urban local authorities are classified into two major categories, the Municipal Corporation headed by Mayor; and Municipal Committee/Council/Board headed by President/Chairman. The Municipal Corporations are set up under specific State enactment for major and specific cities and is bestowed with a certain degree of independence and autonomy in mobilising resources and providing civic services. Notified Area Committees/Authorities look after the civic function in respect of other smaller urban areas.

#### WASTE MANAGEMENT

##### Source of Wastes

The generation of wastes differ in quality and quantity from city to city and locality to locality in a city. More quantities of domestic wastes, trade wastes, yard wastes,

construction wastes, etc. are generated from the areas which are affluent whereas less quantities of such wastes are generated from the areas inhabited by the poor people. However, human excreta, animal wastes, dust, etc. are found more in slum areas. Hazardous solid waste from industries and hospitals are frequently mixed with municipal garbage which in-turn is poorly collected and disposed, creating severe localised health-hazards. Delhi epidemic in 1988 could be attributed to improper management of wastes. So was the case in Ahmedabad in 1988.

#### Quantity and Types of Wastes

Reliable estimates of the quantity of solid wastes generated in various towns are not easily available. A study on Delivery and Financing of Urban Services (1989) by Operations Research Group indicates average per-capita solid waste generated is about 350-400 gms. However, based on the trade and commercial activities in the town the per-capita waste quantity may be more as in the case of Bombay, where it is between 400-425 gms. Per-capita waste generated within the New Delhi Municipal Committee area is between 800-1000 gms/day whereas in the Municipal Corporation of Delhi area is about 300 gms only. Data on quantity of Solid waste treated in the country is not available.

There is also seasonal variation. Fermentable organic matters ranges from 50% to 75%. Paper textile, metals, glass and plastics form a negligible percentage. Inert material like sand, earth, stones, bricks, etc. vary from 15% to 30%. The calorific value of waste is very low, much below 2000 B.T.U.

#### Level of Service

In larger centres like Bombay, Delhi, Madras, Ahmedabad, etc. the waste is collected from collection points and sent to a transfer station, from this point it is then transferred for disposal. In most towns the cleaning of streets and waste is categories in 3 classes. Streets are cleaned every day, once in two days, and once in three days. In terms of vehicle fleet most small and medium towns used tractors whereas it is highly mechanised in larger towns. On an average 83% of wastes generated in metropolitan towns are collected whereas only about 59% are collected in other Class-I and Class-II towns.

#### EXISTING PRACTICE OF SOLID WASTE MANAGEMENT

##### Collection and Transportation

Normal practice is that house owner collects the refuse at his place and dumps the same in a bin located nearby on the street side,

while in some specific areas house to house collection of garbage is made by civic employees. Mostly the garbage is collected by municipalities from these bins and carried away to the place of disposal by means of mechanised transport. In certain cases there are arrangements for collection of garbage from the bins located in narrower streets by the employees in wheel barrows which are then placed in a larger bin on the main road from where the trucks collect the same. At most of the places the waste is thrown around the bin inspite of providing concrete enclosure. In market areas and public places sweepers on the payroll of municipalities collect the garbage from the place of origin and take it to a central bin, from where it is transported to the disposal sites in open trucks. In a smaller municipal areas bullock carts etc. are also used. Special types of trucks like tippers and compactors are rarely used for garbage collection in India.

#### Disposal Methods

##### Recycling

Constituents of the domestic wastes which are commonly extracted for recycling are, paper, rags/textiles, metals, glass, rubber and plastics. In India, some kinds of waste are also extracted from domestic wastes for personal use in the low income areas. These are (i) cinders, fragments of coal, coconut shells, etc. for use as fuel; (ii) metal cans for use as domestic vessels; and (iii) vegetable wastes for animal feed. In the country, recycling of saleable material is one of the methods of earning livelihood for the low income group of people.

##### Disposal on Land

The waste is often observed to be disposed off on land in an uncontrolled manner. These sites are not properly selected and often cause environmental pollution. There is no mechanical equipment at such sites except in a few metropolitan cities. In some sites in metropolitan cities, bulldozers are provided to compact the waste and to give soil cover at the top. However, no proper site selection is carried out in most of the cases. In some of the towns, night soil is collected in tankers and disposed off in shallow pits excavated at such sites which are covered with soil when full.

##### Composting

Resource recovery by composting of waste is commonly carried out in India and in most of the urban centres are known to carry-out manual composting of wastes. Semi-mechanised pilot composting plants were set up in