

Brief on Solid Waste Management in Pakistan

Solid waste collection by government owned and operated services in Pakistan's cities currently averages only 50 percent of waste quantities generated; however, for cities to be relatively clean, at least 75 percent of these quantities should be collected

Unfortunately, none of the cities in Pakistan has a proper solid waste management system right from collection of solid waste upto its proper disposal. Much of the uncollected waste poses serious risk to public health through clogging of drains, formation of stagnant ponds, and providing breeding ground for mosquitoes and flies with consequent risks of malaria and cholera. In addition, because of the lack of adequate disposal sites, much of the collected waste finds its way in dumping grounds, open pits, ponds, rivers and agricultural land.

Urbanization Pattern:

According to the 1981 census, of the 5.92 million persons who had migrated within the country, 87.6% moved from rural to urban areas, while only 12.4% moved in the opposite direction. Over 50% of them permanently settled in cities.

During the last several decades, migration has occurred from rural to urban areas. The chief factors responsible for this migration are: slow progress in the agriculture sector, low crop yields, lack of alternate employment opportunities and environmental degradation due to water logging/salinity, deforestation and desertification.

The large rural influx has, in turn, contributed to the overburdening of urban infrastructure and urban services. There has not only been a rapid decline in the quality and availability of basic urban resources and amenities, such as housing, potable water, transportation, electricity, gas, drainage and sewage but also mushrooming of *katchi abadis* (squatter settlements), often located on the most marginal land. Today, squatter settlements account for about 25 to 30% of Pakistan's overall urban population. The municipal institutions do not have sufficient resources and technical capacity to accommodate the needs of increasing urban population.

According to a study¹, the selected cities are growing at a growth rate from 3.67% to 7.42% which is much higher than the overall growth rate of Pakistan, i.e. 2.8%. Major cities in Pakistan are estimated to double their population in next ten years. These cities are generating high amounts of solid waste which is increasing annually with the respective population growth.

Growth in Solid Waste Generation

Presently it is estimated that, 54,888 tons per day of solid waste is generated in Pakistan. The Ministry of Environment undertook a study during 1996 on "Data Collection for Preparation of National Study on Privatization of Solid Waste Management in Eight Selected Cities of Pakistan". The study revealed that the rate of waste generation on average from all type of municipal controlled areas varies from 0.283 kg/capita/day to 0.613 kg/capita/day or from 1.896 kg/house/day to 4.29 kg/house/day in all the selected cities. It shows a particular trend of waste generation wherein increase has been recorded

¹ National study on privatization of solid waste management in eight cities of Pakistan, EPMC, 1996

in accordance with city's population besides its social and economic development. Table 2² presents city wise waste generation rate with respective daily and annual estimate of solid waste.

Table 2. Waste Generation Estimates

S. No	Cities	Generation Kg/c/day	Rate Kg/h/day	Waste Tons/day	Generated Tons/year
1	Gujranwala	0.469	3.424	824.0	300,760
2	Faisalabad	0.391	2.737	924.3	337,370
3	Karachi	0.613	4.291	6,450.0	2,354,250
4	Hyderabad	0.563	3.941	975.7	356,131
5	Peshawar	0.489	3.423	809.3	295,395
6	Bannu	0.439	2.941	36.0	13,140
7	Quetta	0.378	2.646	378.0	137,970
8	Sibi	0.283	1.896	17	6,205
	Total			10,414.3	3,601,221

Keeping in view the population growth of 2.61 % per year, an estimate of solid waste generation has been made as presented in table 3.

Table 3. Solid waste Generation on the basis of population for 2004

City	Population (Million) 1998 Census	Population (Million) 2004	Solid Waste Generation Rate Kg/C/day	Waste Generated Tons/day	Tons/year
Urban Areas					
Karachi	9.269	10.818	0.613	6,632	2,420,680
Faisalabad	1.977	2.307	0.391	902	329,230
Hyderabad	1.151	1.343	0.563	756	275,940
Gujranwala	1.124	1.312	0.469	615	224,475
Peshawar	0.988	1.153	0.489	564	205,860
Quetta	0.560	0.654	0.378	247	90,155
Bannu	0.046	0.054	0.439	24	8,760
Sibi	0.082	0.095	0.283	27	9,855
Remaining urban areas	27.261	31.818	0.453	14,414	5,261,110
Rural Areas	88.121	102.853	0.283	29,108	10,624,420
Sub-Total	130.579	152.409		53,289	19,450,485
Add 3 % for hazardous waste				1,599	583,635
G Total				54,888	20,034,120

It is important to note there is a big difference in Pakistan between solid waste generation and the amounts reaching final disposal sites. In developed countries, the two figures are usually much the same since most waste arisings must be disposed of formally (although

² EPMC Estimates, 1996

there are moves towards the segregation of some components of waste at the source in a number of countries

The situation is made worse in Pakistan as there are no weighing facilities at disposal sites and no tradition of waste sampling and analysis. Furthermore, the types and quantities of wastes arising and reclaimed vary with the locality and, to some extent, with the season; and areas with more traditional lifestyles tend to generate relatively small quantities of waste, and segregation and reclamation practices are more widespread.

Solid Waste Management Scenario – Strategic Challenges

Solid waste in Pakistan is generally composed of plastic and rubber, metal, paper and cardboard, textile waste, glass, food waste, animal waste, leaves, grass, straws and fodder, bones, wood, stones and fines to various extents. The detailed physical compositions of waste are given in Table 4^{III}.

Table 4 Physical Composition of Waste (% weight) in selected Cities

Cities	Faisalabad	Karachi	Hyderabad	Peshawar	Quetta
Plastic & Rubber	4.80	6.40	3.60	3.70	8.20
Metals	0.20	0.75	0.75	0.30	0.20
Paper	2.10	4.10	2.40	2.10	2.20
Card board	1.60	2.40	1.50	1.90	1.30
Rags	5.20	8.40	4.70	4.30	5.10
Glass	1.30	1.50	1.60	1.30	1.50
Bones	2.90	3.00	2.00	1.70	2.00
Food Waste	17.20	21.00	20.00	13.80	14.30
Animal Waste	0.80	3.00	5.80	7.50	1.70
Leaves, grass etc.	15.60	14.00	13.50	13.60	10.20
Wood	0.70	2.25	2.25	0.60	1.50
Fines	43.00	29.70	38.90	42.00	44.00
Stones	4.60	3.50	3.00	7.30	7.80

The typical composition of municipal solid waste in Pakistan is shown in Table 5

Table 5. Typical Composition of Solid Waste in Pakistani Cities (%)

Composition	%
Food Waste	8.4% to 21 %
Leaves, grass, straw, Fodder	10.2 % to 15.6 %
Fines	29.7 % to 47.5 %
Recyclables	13.6 % to 23.55 %

Presently domestic waste in Pakistan has not been carried out in a sufficient and proper manner in collection, transportation and disposal regardless of the size of the city. Solid waste management by municipalities as a whole is quite inefficient as it collects only 51-

69% of the total waste generated. No weighing facilities are installed at disposal sites. The scavengers play an important role as they separate recyclable at various steps of existing solid waste management. Hazardous hospital and industrial wastes are being simply treated as ordinary waste. Open burning of waste especially non-degradable components like plastic bags are adding to air pollution. Municipalities have been reported to spend considerable portion of their budgets on solid waste management but as a return receive nothing (no tax) from the population being served.

Institutional, Legal and Management Aspects

The Planning & Development Division at the federal level and Planning & Development Departments at the provincial levels are responsible for the preparation of development plans and allocation of resources. At the federal level, the Ministry of Environment is responsible for the development of policies and programmes under the environment theme. The Pakistan Environmental Protection Agency (PEPA) and provincial EPAs are the main regulatory bodies for the implementation of Pakistan Environmental Protection Act, 1997.

In Pakistan, municipal governments are usually responsible agency for solid waste collection and disposal, but magnitude of the problem is well beyond the ability of any municipal government. Under the recently devolved local government system, the Town/Tehsil Municipal Administration (TMAs) are responsible for the solid waste collection, transportation and disposal. However, TMAs are unable to cope with continuously increasing volumes of municipal waste due to inadequate funds, lack of rules, regulations and standards, lack of know how on the subject, lack of expertise and lack of collection vehicles and equipment.

Solid Waste Management Policy

The Government of Pakistan enacted the Pakistan Environmental Protection Act (PEPA) in 1997--which is the most recent and updated legislation on environment. It provides a framework for establishing federal and provincial Environmental Protection Agencies (EPAs). One of the functions of Pak-EPA is to assist the local councils, local authorities, Government Agencies and other persons to implement schemes for the proper disposal of wastes so as to ensure compliance with the standards established by it.

Presently the legal rules and regulations dealing with solid waste management in Pakistan are as follows:

Current

- Section 11 of the Pakistan Environmental Protection Act prohibits discharge of waste in an amount or concentration that violates the National Environmental Quality Standards.
- Draft Hazardous Substances Rules of 1999.
- Islamabad Capital Territory Bye Laws, 1968 by Capital Development Authority Islamabad
- "Section 132 of the Cantonment Act 1924 deals with Deposits and disposal of rubbish etc
- Provisions contained in the Local Government Ordinance, 2001

Required

The rules and guidelines that are yet to be introduced include:

- Basic Recycling rules
- Waste Management rules
- E-Waste Management rules
- Development of Environmental Performance Indicators (EPI)
- Eco-Labeling guidelines and its promotion
- Adoption of Life Cycle Assessment Approaches
- Guidelines for Environmentally Sound Collection and Disposal
- Guidelines for model landfill sites