

FOREWORD

Solid Waste Management has been one of the neglected areas of urban management activities in India. By and large, in cities and towns hardly 50 per cent of the solid wastes generated are collected, transported and disposed off, giving rise to insanitary conditions and diseases, especially amongst the urban poor who constitute about 35 per cent of the urban population.

It is estimated that out of one billion people living in the country about 300 million reside in urban areas. It is likely that 40 per cent of the urban population would be residing in 40 Metros by 2001. The situation is frightening, big towns are becoming bigger, bigger ones are becoming metros and metropolises are becoming mega-polises. Concerned Urban Local Bodies responsible for providing the basic services like Water Supply, Sewerage and Solid Waste Management and other amenities to the people are finding it increasingly difficult to cope up with the demand due to fast growth of urban population, thereby adversely affecting the management of such services to the people.

Efficient garbage collection, transportation and disposal are among the vital functions of Urban Local Bodies. Despite the fact that a large number of staff is employed by them to discharge this function and a substantial portion of their annual budget is spent only on garbage collection, transportation and disposal, the situation in the towns and cities remains far from satisfactory. The issue of recycling of solid waste has not received due attention. With the solid waste generation increasing with time, the importance of recycling needs to be recognized and given due importance.

The continuous deterioration of quality of life in urban areas has underlined the need to create better environmental conditions and evolve a workable national strategy for solid waste management. As a follow-up, the Ministry of Urban Development had constituted an Expert Committee in February, 1998 for preparation of "***Manual on Municipal Solid Waste Management***". The Expert Committee had done a commendable job and brought out the Manual, which is now available to the Urban Local Bodies and other User Agencies to guide them for planning, designing and implementation of solid waste management projects in urban areas.

I am confident that the Urban Local Bodies and other service providers will find this Manual very useful as a practical tool for discharging their day to day functions in a more effective, efficient and sustainable manner with respect to Municipal Solid Waste Management.

{ JAGMOHAN }

ANNEXURES

- Annexure 1.1 Municipal Wastes (Management & Handling Rules, 1999)
- Annexure 5.1 Environment (Protection) Act, 1986
- Annexure 5.2 Guidelines for Financial Assistance for Setting up of Slaughter Houses and Carcass Utilization Centres
- Annexure 5.3 Draft Guidelines for Sanitation in Slaughter Houses
- Annexure 6.1 Categories of Industries to be restricted for their operation in Non-Conforming areas
- Annexure 7.1 Solid Wastes – Hospitals – Guidelines for Management
- Annexure 7.2 Bio-Medical Waste (Management & Handling) Rules, 1998
- Annexure 7.3 List of States where Prescribed Authority has been set up for supervising the Implementation of the Bio-Medical Waste (Management & Handling) Rules
- Annexure 7.4 Comparison of Treatment Technologies for “Bio-Medical Waste”
- Annexure 7.5 Schematic of pit for deep burial of Cate Goryi-Bio-Medical Waste (based on Bio-Medical Waste Management Handling Rules)
- Annexure 12.1 The Specification for Construction of Waste Storage Depot
- Annexure 12.2 General Specification of 7 cu.mt. capacity Garbage Containers to be handled by 7 cu.mt. D.P. units
- Annexure 13.1 Hydraulic Vehicle Inspection Schedule
- Annexure 13.2 Schedule of Maintenance of Trucks & Vehicles
- Annexure 13.3 Minimum equipments/tools required for workshop to Maintain a fleet of up to 50 Vehicles
- Annexure 15.1 Waste to Energy Case Studies
- Annexure 15.2 Ministry of Non-Conventional Energy Sources
- Annexure 17.1 Estimation of Landfill Capacity, Landfill Height, Landfill Area
- Annexure 17.2 Typical Example (Preliminary Design)
- Annexure 17.3 Estimation of Landfill Cost based on Preliminary Design

Annexure 19.1	Typical Organizational Chart for a activity of 30 lacs Population
Annexure 19.2	Brief Course Content for Training to various Levels of Staff/Officers.
Annexure 20.1	Government of Tamil Nadu
Annexure 21.1	Cost estimates for Modernization of Solid Waste Management Practices in Urban Areas
Annexure 21.2(a)	Salient Features of Ministry of Agriculture Guidelines for Recovery of Compost from Urban/Municipal Waste
Annexure 21.2(b)	HUDCO's Financing
Annexure 21.2(c)	An Example : Financing Hospital Waste Management Schemes by HUDCO
Annexure 22.1	Impact Identification Network for Collection System
Annexure 22.2	Impact Identification Network for Disposal System
Annexure 23.1(a)	Daily Monitoring on Collection of Waste from Waste Storage Depot
Annexure 23.1(b)	Primary Collection Operation Summary Table
Annexure 23.2(a)	Monitoring of Transfer Stations Operations (Entry Record Sheet)
Annexure 23.2(b)	Record of Transfer of Waste from Transfer Stations to Disposal Site
Annexure 23.3(a)	Vehicle Movement Monitoring
Annexure 23.3(b)	Vehicle Utility Monitoring
Annexure 23.3(c)	Monitoring Fuel Consumption
Annexure 23.3(d)	Drivers Attendance Monitoring
Annexure 23.3(e)	Vehicle Repair Report
Annexure 23.3(f)	Monitoring Cost of Operations
Annexure 23.4	Monitoring of Landfill Operation
Annexure 23.4(a)	Daily Waste Disposal Record Sheet for Zone
Annexure 23.4(b)	Monitoring Waste Disposal from all Zones/Divisions

- Annexure 23.4(c) Monthly Record Sheet of Waste Disposal
- Annexure 23.4(d) Equipment Performance Report
- Annexure 23.4(e) Carbon Utility Report
- Annexure 23.4(f) Operating Cost Summary Table
- Annexure 23.4(g) Disposal Cost Summary
- Annexure 23.4(h) Waste Processing Report
- Annexure 23.5(a) Project Information Report
- Annexure 23.5(b) Project Monitoring Report (Name of the Project/Value of the Project)
- Annexure 23.6(a) Financial and Economical Information – Revenue Receipts
- Annexure 23.6(b) Revenue Expenditure
- Annexure 23.6(c) Capital Receipts
- Annexure 23.7(a) Monitoring of Court Cases
- Annexure 23.7(b) Enforcement Measures