

Solid Waste Management in Bruhat Bangalore Mahanagara Palike (BBMP)

City Statistics

Area: 800 sq km

Population(2008): 78 lakhs

Households: 25 lakhs

Commercial Properties: 3.5 lakhs

No of Zones: 8

No of Wards: 198

- Estimated MSW generation Projection for 2009, from all sources for BBMP zones is ~ 3000 tpd
- Per capita waste ~ 350 grams per day (gmpd) (domestic waste)
- Households contribute to ~ 54% percent of the total waste; Markets & function halls contribute to 20% and commercial establishment & institutions contribute to 17% and others 9%
- Segregation of waste at source 10%

Composition of Municipal Solid Waste:

Physical composition of MSW (%)

Sl.no.	Vegetable	0.30
1	Paper	0.09
2	Plastic	0.12
3	Cardboard	0.04
4	Textiles	0.04
5	Grass/leaves/wood	0.06
6	Leather	0.00
7	Battery	0.00
8	Electronic item	0.02
9	Metal	0.01
10	Organic	0.23
11	Glass	0.03
12	Debris	0.05
13	Biomedical	0.02
	Total	1.00

Chemical composition of MSW (%)

Sl.no.	Constituent/Property	Minimum	Maximum
1	C	13.00	42.60
2	N	0.28	1.23
3	P ₂ O ₅	0.46	0.92
4	K ₂ O	0.45	1.07
5	Moisture %	13.80	40.90

6	Bulk Density	341.00	491.00
7	Calorific Value	684.00	1240.00

(source:SWM Master plan 2008)

As per the Municipal Solid Waste Management rules 2000 BBMP is responsible for taking the waste management as per the stipulation.

For Administrative purpose BBMP is divided into 8 zones, 3 zones in old area(core area) & 5 zones in new area(adjacent 7 CMC's & one TMC) .

- About 70% of the MSW (Municipal Solid waste) activity starting from primary collection to disposal has been outsourced & 30% is managed by BBMP
- There are about 4300 Pourakarmikas (Sweepers) of BBMP & 10000 Pourakarmikas (Sweepers) from contractor who performs Door to Door collection & sweeping activities.
- In some of the area in the new zones the Door to Door collection activity is entrusted to Self Help Groups (SHG's). which are basically below poverty women's groups
- In some of the residential areas the Residential Welfare Associations (RWA's) are involved in Door to Door collection & decentralization of composting the waste

Primary Collection(Door to Door collection)

- The primary collection is performed using pushcarts & auto tippers
- There are around 11000 pushcarts & 650 auto tippers for Door to Door collection of waste.
- Waste is collected in the unsegregated form as segregation is not practiced at source.

Secondary collection and Transportation

- There are about 600 MSW transportation vehicles including Compactors, Tipper Lorries, Dumper placers & Mechanical Sweepers both BBMP and contractors.
- The waste collected from the households is brought to a common point ie., secondary locations from where the waste is shifted to the treatment sites through compactors & tipper lorries.
- Segregation at source & the secondary storage is not happening hence unsegregated waste reaches the processing plants.

Street Sweeping activity

- Street sweeping is performed both manually & mechanically. In some of the highly commercial activity areas sweeping is done at night & in the VIP areas the sweeping is done Mechanically. The street sweeping

waste is carried along with the primary collection waste to the land fill sites.

Decentralized processing plants

- Some of the areas where RWA's are performing Door to Door collection, the waste is segregated at source & the organic waste is **composted in the** community in a small scale.
- BBMP has setup a 15 ton capacity decentralized plant to process organic waste as well as recycle the plastic, metal etc
- BBMP has established an decentralizes one ton capacity aerobic composting unit at Malleshwaram market (West Zone) using organic waste convertor.

Dry waste collection centers

- Dry waste collection centers has been set up for recycling the dry materials like plastic, paper, glass, metals etc

Processing & Disposal sites

In order to comply with MSW rules, The BBMP has setup processing & Disposal facilities on PPP model. Following are the processing & disposing facilities.

Sl. no	Name of the project	Capacity of the plant	Technology adopted
1	M/s Ramky	600 MTPD	Aerobic Composting & scientific land fill
2	M/s S.G.R.R.L	1000 MTPD	Waste to energy (Presently composting & land filling the inert & combustible. material are stored for RDF)
3	M/s Terrafirma	1000 MTPD	Integrated system where composting, vermi composting, biomethanization is followed
4	M/s Organic Waste India pvt ltd (yet to start)	1000 MTPD	Integrated system (yet to commission)

- The combination of technologies for processing of MSW attempted for sustenance & viability.
- Generally around 30 to 40 percent of inert rejects which includes recyclables are going to the scientific landfill.
- Attempt is being made to utilize all the recyclables

- Small quantity of Waste Plastic are segregated and used in the construction of pavement roads.8% of Poly blend is mixed in the asphalt
- It is seen there is possibility of converting the plastics into diesel by following depolymerization technology which is yet to be implemented in large scale.
- Our aim is to adopt zero waste management or reduced the quantity of inerts that goes to landfills by less than 10% by recycling other inerts wherever possible.

Vehicle Tracking System using GPS

- To bring in accountability for the distance traveled by the vehicles GPS/GPRS Based Tracking system is implemented.
- About 350 vehicles are fitted with the GPS

CCTV and Hand held device

- CCTV cameras have been installed at all the processing sites at the entry and exit points to view the vehicles reached.
- Also a ticketing system using Hand Held Device, which collect the data and send it to the central server for monitoring and analysis.
- The entire truck numbers and operation schedule is automatically downloaded to the Hand Held device through GPRS

e-waste

- Bangalore being the silicon valley huge quantity of e-waste is generated.
- Recyclers identified by the KSPCB are managing the e-waste at large IT companies.
- Today the e-waste is one of the rapidly growing environmental problems
- With extensive use of computers and other electronic equipments coupled with increasing discarding habits, rapid technological change, there is a significant increase in e-waste generation at the household level and public sectors which has to be addressed.