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## MUNICIPAL SOLID WASTE MANAGEMENT-A CASE STUDY OF HYDERABAD

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### ABSTRACT

*Solid Waste management is one among the basic essential services provided by municipal authorities in the country to keep urban centers clean. However , it is among the most poorly rendered services in the basket – the systems applied are unscientific, outdated and inefficient ; population coverage is low ; and the poor are marginalized. Waste is littered all over leading to insanitary living conditions. The energy and Resources institute ( TERI) has estimated that waste generation will exceed 260 million tones per year by 2047 which is more than five times the present level. Ministry of Environment and Forests, Government of India (MoEF) legislated the MSW rules, in September 2000. These rules are applicable to every municipal authority responsible for collection, segregation, storage , transportation , processing and disposal of MSW. The Greater Hyderabad Municipal Corporation ( GHMC) was formed on 16<sup>th</sup> April , 2007 by merging 12 Municipalities and 8 Gram Panchayats . In this present study the case of Hyderabad is taken because , various methods and marking procedure involves in the MSWM in Hyderabad. In this study assessment of the method has been done based on a wide area . In this study an effort has been taken to enlighten the good sides of MSWM methods and also a serious effort has been taken to discuss the loopholes of the entire MSWM system so that in future the correct steps can be taken to solve the drawbacks of the system of the specified area and also the other areas. In this case study our objective is to assess the emission mitigation potential of MSWM system and also to discuss the job creation potential through proper policies in this sector.*

**KEYWORDS:** MSWM, TERI, Segregation, Marginalized, MoEF

### INTRODUCTION

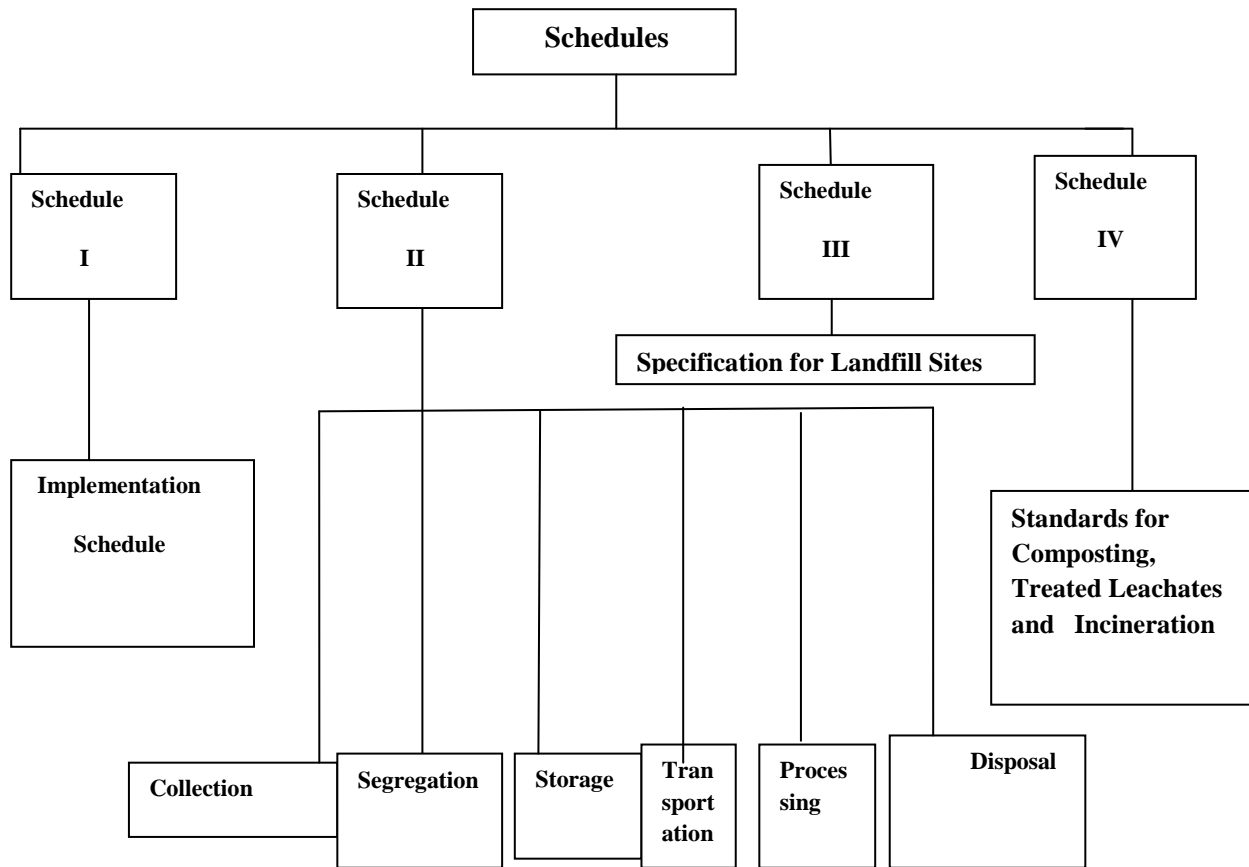
Over the last two decades rapid urbanization , change in life styles and rise in population has resulted in generation of huge quantities of Municipal Solid Waste (MSW). The quantity of MSW generated is much higher than the quantity collected, transported and disposed , leading to piling up of uncollected waste in streets , public places and drains. Even the collected waste is mostly dumped on the outskirts of towns / cities and has created serious environmental and public health

problem. According to the studies , individuals who live near or on disposal sites are infected by gastrointestinal parasites , worms and other pathogenic organisms. Though Municipal solid Waste Management (MSWM) is an essential and obligatory function of the Urban Local Bodies (ULBs) , service levels in MSWM continue to fall short of desired levels. . The recent launch of National Urban Sanitation Policy ( NUSP) , assistance to integrated MSWM projects under the Jawaharlal Nehru National Urban Renewal Mission

(JNNURM) and the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) have provided the much needed momentum in a sector that is critical to improvement in overall urban hygiene, but continues to be a relatively neglected and unattended space. IN the late 1990s also saw an increase in private role in establishing composting and waste treatment plants and a significant public interest in the sector, as evidenced by the large number of Public Interest Litigations (PILs) relating to MSWM. With rapid urbanization and economic growth and an increase in

per capita waste generation, annual municipal solid waste generation is estimated to grow more than five-fold from the current level of 70 million tons to reach 370 million tons by 2030 (source; McKinsey Global Institute). The major gaps in services related to MSW exist in the coverage of collection services, scientific processing and disposal of the waste. The rules require that the municipal authority shall adopt suitable technology or combination of such technologies to make the use of waste so as to minimize the burden on land.

**FUNCTIONAL FRAMEWORK OF THE MSW RULES**



**Municipal Solid Waste (Management and Handling) Rules, 2000**  
Waste by Source

Sources	Examples of recyclable waste generated
Residential (Single and multi family homes)	Old newspapers, clothing, packaging, cans and bottles, food scrapes and yard trimmings.
Commercial( office buildings, wholesale and retail business and restaurants)	Old corrugated containers (OCC) , Office papers , yard trimmings, wastes from food/ drink vendors ( food scrapes, disposable tableware, paper napkins, cans and bottles).
Institutional ( Schools, Libraries, Hospitals and Prisons)	Office papers , books, yard trimmings and wastes from cafeteria and other food/ drink vendors
Industrial ( Packaging and administrative, but excluding process wastes)	OCC, Plastic film, wooden pallets , papers and cafeteria wastes( food scrapes, disposable tableware , paper napkins and cans and bottles)

Source : USEPA, 2004c

### A case Study of Municipal Solid Waste Management system in Hyderabad :-

The Greater Hyderabad Municipal Corporation (GHMC) was formed on 16<sup>th</sup> April, 2007 by merging 12 Municipalities and 8 Gram Panchayats with the then Municipal Corporation of Hyderabad. The GHMC comprises the erstwhile Hyderabad Municipal Corporation, plus 10 municipalities and eight Panchayats in Ranga Reddy district, and two municipalities in Medak district .

### A).Solid Waste management ( MSWM) Department :-

The Solid waste management department in the city is headed by the Additional commissioner ( S& H ) , who is responsible for all Municipal solid Waste ( MSW) and health programmes and is assisted by Chief Medical officer and Assistant Medical officers , Sanitary Supervisors, Public Health Inspectors and Sanitary Inspectors for discharging the MSWM functions. .

### Staff in GHMC

Sl No	Nature of Work	Number
1	Chief medical Officer of Health	1
2	Assistant Medical Officers of Health	15
3	Sanitary Supervisors	65
4	Head Sanitary Jawans	38
5	Sanitary Jawans	187
6	Sanitary Workers- regular staff	4118
7	Sanitary Workers outsourced	15984

Source :- GHMC Officials

### Data Analysis of Employment:-

In Municipal Solid Waste management network Sanitary workers ( regular , outsourced) plays a pivotal role. So, for giving them a healthy, work friendly environment and also securing their life from various risks and hazards , proper insurance system must be introduced . Poor , marginalized and women workers need protection. The only way out to secure employment in this alternative energy producing sector is to create a SHG group of the sanitary workers and connect the workers with banking System. Also for

their safety proper insurance support system must be introduced. So, crux of the whole issue is that a well framed **tripartite agreement** is needed for safety, security of the sanitary workers and their work force participation rate .

### Waste Generation:-

MSW generation estimated by the Greater Hyderabad Municipal Corporation (GHMC) is around 3800 TPD. Table 4 shows the sources of waste generators in the city .

### Waste generators in the City :-

Sl No.	Source	Waste generated(TPD)	%
1	Households	1,675.41	44.09
2	Commercial Establishments & Hotels	989.80	26.09
3	Street sweeping and drain cleaning	494.40	13.01
4	Hospitals	30.97	0.82
5	Vegetable and other Markets	609.40	16.04
<b>Total</b>		<b>3800.00</b>	<b>100.00</b>

Source :- GHMC Officials

### Data Analysis for Waste Generation:-

We know that – 500 Tons per day ( TPD) Waste if generated , produces 5 MW of Power ( Source – United States Asia Environment Partnership Report, 2004) . Now if 3800 TPD Waste generates, it corresponds to production of 38 MW of Power , which is Environment friendly Clean source of Power. Waste to Energy ( WTE) offers several advantages over Land filling which are Energy & Metals recovery , GHG reduction estimated conservatively at 1 ton of CO<sub>2</sub> per ton of MSW processed by WTE rather than Land filled & most

importantly from the viewpoint of sustainable development.

Now, calculating method is- 1 Tons of MSW if it is processed , then it will reduce = 1 Ton of CO<sub>2</sub> Emission & 1 Tons of MSW if it is processed, then it will reduce = 21 Tons of Methane ( CH<sub>4</sub> ) Emission. ( Source :- United States Asia Environment Partnership Report, 2004). Now from the Hyderabad Case Study it can be seen that 3800 TPD Waste is generated from various sectors of GHMC. So, if generated 3800 TPD Waste is processed, then it will also reduces the 3800 Tons of CO<sub>2</sub> Emission and 79,800 Tons of CH<sub>4</sub> Emission.

### WTE Projects in Hyderabad

Firm	Assured MSW	Royalty by Pvt. Firm	Project Cost (Rs. Cr)	Power Generation (MW)	Land for the Project	Contract Signing
SELCO International Ltd	700 TPD	Rs.25 per ton of mixed MSW	Rs. 34	7	10 acres land on 30 years lease by GHMC	24 <sup>th</sup> May , 1997
RDF Power Projects Ltd.	700 TPD	Rs. 25 per ton of mixed MSW	Rs.47.2	10	26 Acres of land acquired by private Player	18 <sup>th</sup> May, 2000 , then Supplementary MoU on 18 <sup>th</sup> May ,2006

Source :- GHMC Officials

### Data analysis of Power generation of WTE Project and calculation of Emission reduction :-

We know from the data of Central Electricity Authority ( CEA) Website that – A 630 MW Power producing Coal based Power Station burns about 300 tons of Coal / Hour. Now if 17 MW Power producing unit is used ( coal based), then ,  $(300/630)*17= 8.09$  Tons of Coal burning will takes place per hour and annually 2102400 Tons of Coal burning will takes place in the atomosphere. If instead of using 17 MW Coal based power, 17 MW power by using Municipal solid waste can be made and used then it will reduce the 2102400 tons of coal burning into the atmosphere and as a result also will reduce the CO<sub>2</sub> emission due to coal burning into the atmosphere.

Also from the CEA's information source it has been found that each unit of electricity generation from coal corresponds to emission of average 830 gms. of CO<sub>2</sub> to the atmosphere and consumption of 3 liters of water.

Now each unit of electricity = 1 Kilowatt-hour. 1 KWH electricity generation corresponds to 830 gm of CO<sub>2</sub> emission into the atmosphere, then 17 MWH ( Megawatt hour) electricity generation from convention power source ( coal based) corresponds to=  $(1*1000*830*17)= 14110000$ gm. of CO<sub>2</sub> emission into the atmosphere and use of =  $(1*1000*3*17) = 51000$  liters of Water. ( N.B.- 1000 Watt= 1 Kilowatt, 1000 Kilowatt= 1 Megawatt ) .

Now, if the 17 Megawatt power produced from Municipal Solid Wastes can be supplied to the community , then 14110000 gms of CO<sub>2</sub> emission and 51000 liters of Water use can be reduced.

Here one thing must be mentioned for the information purpose. Clean coal technology and good quality imported coal if used in the power stations for producing power then also emission can be reduced, but in our country in most of the places indigenous poor quality coal is used which creates emission. Imported coal is also expensive. So, if alternative methods of power production is used in all parts of our country using alternate sources of

energy other than coal, then coal use can be restricted in a bigger extent and emission can also be reduced in a eco-friendly way.

## CONCLUSION

1).It is critical to have a holistic communication plan . Structured Integrated activities to involve community with informal workers , residents etc and the internal stakeholders like sanitary workers, employees is extremely needed for the effective implementation of MSWM projects in a environment friendly way. 2). There is a need to cooperate between National Missions and State Missions for effective working of MSWM Projects. 3). Jointly working of various municipalities is very much needed in case of small municipal areas. 4). The biggest problem of MSWM project is that in many times the waste materials are not segregated at source properly . So , if it can be done in a proper and wide spread manner , the fruitful result can be achieved. 5). There is a huge employment opportunity in MSWM Projects as we have seen in the case study of Hyderabad. So , if more and more people can be trained in a properly coursed framework , then it will create a great employment opportunity. 6). If more and more bio manures can be made through the MSWM projects it can be helpful for the agricultural sectors of the rural areas ,in a eco friendly way and by this process we can get rid off from the harmful effects of chemical fertilizers to a huge extent .

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