

Solid Waste Management Practices in Bengaluru

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I. INTRODUCTION

According to Central Pollution Control Board (CPCB, 2014) Solid Waste Management (SWM) is one of the major problems being faced by cities in India. Waste quantity is continuously increasing, while the central, state and local authorities are not able to upgrade technologies, manpower and skills set to handle it. The result of it is, as per information received from State Pollution Control Boards/ Pollution Control Committees 1,27,486 TPD (Tons per day) municipal solid waste was generated in the Country during 2011-12. Out of which, 89,334 TPD (70%) of it was collected and 15,881 TPD (12.45%) is processed or treated. The problems being faced into it is, no long term or short term strategies are there with Urban Local Bodies (ULB), Non preparedness for proper disposal, or recycle of waste, market for recycle goods is not yet matured in India, with increasing population density landfill sites may not be available in future.

Bengaluru is the 5th most populated city in India according to census of 2001 and 2011. According to the census study done during 2011 Bengaluru population is almost 1 crore, which is almost double since 2001 census. (Ministry of Urban Development, 2015). Dense population, growing economy, rapid urbanization, and rising standards of living has given birth to a social, political, economical and geographical problem of improper management of waste. Solid waste is hazardous to all forms of living beings if not managed properly. (Pinnock, 1998) Apart from destruction to air and water quality inadequate Solid Waste Management (SWM) also causes morbidity. The city is spread into 800 Square Km, which is divided into 8 zones and 198 wards. The city generates almost 5000 tonnes of garbage everyday which is almost 400gm per day domestic waste, which is cleaned up by nearly 18000 workers, local authority Bruhat Bengaluru Mahanagar Palike (BBMP) is responsible to generate and implement effective and efficient strategies for SWM. Domestic waste being approximately 54%, commercial waste is 17%, market and part hall waste is 20% and others being 9%. Waste generated mostly comprises of vegetable (30%), plastic (12%), paper (9%), grass, leaves & wood (6%), debris (5%), textile (4%), biomedical (2%). Waste generated in the city emit's gas like carbon (being the maximum), nitrogen, potassium oxide, phosphorous oxide. Moisture content in waste generated is as high as 40.90%. Almost 70% of Municipal solid waste management activity is outsourced. In most of the new zone door to door garbage collection activities has been outsourced to Self Help Groups (SHG), which majorly comprises of women who are below poverty line. Only 15% of the garbage is segregated at source. Waste is collected from door to door around the city using approximately 12,000 pushcarts and almost 750 auto tippers. Waste collected from households, in a locality are brought to a collection point, which are called as secondary points. From here almost 700 vehicles of BBMP and private contractors transport municipal solid waste through trippers, tractors, lorries and compactors to the treatment site and processing plants. There are few areas where waste is segregated at source, collected by Residents Welfare Association (RWA) and composting is done. BBMP has set up few units where organic waste is processed, or recycling for plastic and metallic waste is done, but the capacity of such units is quite less as of now. A very small quantity (0.8%) of plastic is used for construction of pavement roads. There is PPP mostly for disposal using aerobic composting, vermin composting, scientific landfills, biomethane technology and integrated system. Almost 30-40% of recyclable waste is going for scientific landfill. Plans are to utilize all recyclable waste instead of disposing them at landfills. Using technology, plastic can be converted into diesel, but this still remains as a un-trapped option. In order to avoid illegal disposal of garbage, GPS/GPRS has been enabled in some of the vehicles utilized to transport waste to processing site or landfills. Even though, municipalites faces problems in discharging their duties due to SWM being a multidimensional problem, with complications in role of various stakeholders and financial constraints. Also stakeholders have varying interest into SWM. This research will be determination factors influencing behavior of stakeholders and formulation of a pragmatic model integrating role of all people and authorities with objective of developing garbage free Bengaluru.

II. CPCB GUIDELINES FOR MUNICIPAL SOLID WASTE (MSW)

In accordance with the Provision (8) of the Municipal Solid Wastes (Management and Handling) Rules, 2000, the Central Pollution Control Board (CPCB) is required to prepare a Consolidated Annual Review Report (CARR) on implementation of the Municipal Solid Wastes (Management and Handling) Rules, 2000 in the country and forward it to the Central Government (Ministry of Environmental and Forests) along with

suggestions/recommendations before 15th December every year. According to the MSW Rules, 2000, urban local bodies (ULBs) are required to forward Annual Reports to concerned SPCBs/PCCs before 30th June every year and in turn SPCBs/PCCs should forward the Annual Report in the prescribed form every year before 15th September to CPCB. The Consolidated Annual Review Report is prepared by CPCB every year based on the annual report received from the State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) (CPCB, 2014). According to information available from 2001-02 till 2013-14 state of Karnataka State Pollution Control Board(KSPCB) has not submitted its reports for 2 years i.e. 2010-11 and 2012-13. In the latest report of 2013-14 state of Karnataka has not informed about any authorization status.

According to CPCB 2013-14 report (CPCB, 2014) Bangalore city produces 3500TPD of MSW, of which 3000 TPD(85%) is processed. 170 dry waste collection centre's are placed in the city across different wards. There are 13 decentralized biomethanation plants set up of which only 4 are operational. Land filling without processing is done at Bingipura and Lakshmipura facilities. Another six new facilities (of 2300 TPD) are being setup at Kanahalli, Seegihalli, Doddabidarkallu, Lingaderenhalli, Subrayanpalya, and Chikkanagamangala & KCDC. Karnataka SPCB has evolved guidelines for Buffer zones around MSW sites. The mix waste is processed at 11 sites, Mix waste processing with landfill at 7sites, Biomethanation plants at 15 sites. House to house collection has started in most of the area's in two different bins for dry and wet waste, but it is mixed again while transporting it to landfills. Hotel's in Bengaluru have agreed to generate maximum 250 TPD of MSW, which will be used for biogas generation. In Bangalore, 80 TPD sanitary napkins are disposed through 3 incinerators. Although source segregation recommended at household level, the implementation is yet to be done except in few pockets. Karnataka UID has framed the state policy on integrated solid waste management and normative standards/procedures for collection, storage and transportation of MSW. Local bodies have not set up intermediate storage points. They use vacant land, major roads for intermediate storage and transfer of waste. MSW is transported using vehicles outsourced agencies. Covered vehicles are not used and spillage of waste is common. Order issued to register Waste transporting vehicles so that only specific vehicles with hydraulic compactors are used to avoid spilling.

III. LEARNING FROM BEST PRACTICES

Brazil has a government policy for waste management, which promotes reduce, recycle and reuse of waste . Only processed waste is disposed which is not harmful for the environment. Industry and household are incentivized for using recycled goods and clean technologies. Since 2014 all unregulated landfills have been shut down. (Pandey & Malik, 2015). Similarly in Europe, Bio degradable Waste Management(BWM) is set up at Austria , Netherlands and United Kingdom, which separates bio degradable waste from municipal waste. Pay AS You Throw(PAYT) and organic waste tax is being imposed, this provides a incentive to public to reduce waste generation. Landfills Allowance Trading System(LATS) is another policy by UK government which provides more flexibility to local authorities . In Germany and then in almost all countries of Europe is a policy of Duales. Which makes it the responsibility of the producer of a product to ensure collection , recycle or disposal of main packaging material in a eco-friendly way .It has also reduced the cost for local bodies. While in Denmark, waste is segregated at source and local authorities are responsible for its recycling, residents have to pay polluter payer tax. (Pires, Martinhi, & Chang, 2010)

IV. CONCLUSION

With growth and development of economies, population has also increased in urban India. For most countries modern lifestyle has a byproduct, increased waste. Type of waste generated by fast growing cities is also quite diversified. All this has resulted into high expectations from local municipalities, in terms of technical skills, manpower and financial budget. At this stage it is necessary that all the stakeholders in solid waste management understand their role at various stages, right from waste generation to its reuse, recycle or disposal. So as to develop a effective system which ensures a balance between economic growth and environment protection.

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