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Municipal Solid Waste Management in Surat City

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ABSTRACT

A major area of concern all over the world is the hazard of Municipal Solid Waste (MSW). A rapid increase in Municipal Solid Waste (MSW) is witnessed in our developing country, India that is gearing up for expansion and rising in population. A system that carries out the generation of waste, storage, collection, transportation, processing and final disposal of the solid waste is called Solid Waste Management (SWM). This service is rendered to the society by the Urban Local Bodies (UBL) in our country India. The Solid Waste Management (SWM) is a major problem for the local bodies in urban areas of India as industrialization; urbanization and rise in the economic condition are seen responsible for the increase in generation of Solid Waste Management (SWM) per person. The paper aims to throw light on the practices of solid waste management, the issues faced because of it, the existing scenario of MSW, the steps taken by the Surat Municipal Corporation and the legislations of SWM 2016 associated with the system of waste management in Surat. Recommendations on how to effectively manage the waste, the innovative and modern techniques employed by the Surat Municipal Corporation under the regulations of MSW 2016 have been discussed here. The data has been taken from the records of Surat Municipal Corporation. Several lacunas in the present system of Solid waste management of Surat have been observed as per the SWM rules 2016.

I. ISSUES IN SOLID WASTE MANAGEMENT

Surat Municipal Corporation faces several issues in the managing of solid waste generated in the city. There is a lack of awareness in the public that waste should be stored at the source only. Public is not conscious and sensitive towards green and clean environment. Public is not actively participating in keeping the city neat and clean. Also there is a lack of good governance for the same.

Nobody wants dustbin, dumping site etc. nearby there house. Effective and efficient solid waste management is challenging because millions of people are involved and it is very difficult to educate every individual for the storage of waste at sources.

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II. HYPOTHESIS

The following hypothesis is framed which is to be tested by the author.

In Surat all the rules regarding solid waste management is not being followed completely. Lots of things are to be followed in a strict manner for efficient waste management.

III. RESEARCH METHODOLOGY

The methodology used here in the paper is Doctrinal Research Methodology and is based on existing guidelines comprised of the following distinct features:

The data has been obtained from Surat Municipal Corporation and other reliable sources, studied and correlated with the present investigation. The research work includes the waste collection, transportation, disposal, issues in waste management and legal aspects of MSW 2016 and laws relating to waste management in India.

IV. STATEMENT OF PROBLEM

The most significant that SMC is expected to create awareness among its citizens for separating waste at source. The rules regarding waste management should be implemented very strictly. SMC is lacking in following the guidelines of waste management so it is facing many facing issues regarding the same. If rules are not being followed then it would lead to issues in public health at large scale and environment would also be affected. Any individual is not separating dry and wet waste at source then that person should be penalized. By doing so, the public will start contributing SMC for proper waste management in the city.

V. OBJECTIVE

The paper aims to throw light on the practices of solid waste management, the issues faced because of it, the existing scenario of MSW, the steps taken by the Surat Municipal Corporation and the legislations of SWM 2016 associated with the system of waste management in Surat.

Surat is the biggest trade hub in Gujarat and is one of the fastest growing cities in terms of infrastructure and urban development. It is located at a distance of about 250 Km to the North of Mumbai on the banks of river Tapi. The current population is approximately 69 lakhs. The city produces more than 1550 Metric Ton solid waste daily.

VI. INTRODUCTION

Waste is defined as product at the end of its cycle, any discarded items, unwanted material or object that we throw away and material arising from human and animal activities that are discarded as useless and or unwanted.² Solid Waste Management is a process which refers to the processing and collection of solid waste.³ There are various types of solid waste collected by municipal corporations like biodegradable waste, non-biodegradable waste, street waste, bulky waste, industrial waste, hazardous waste, construction and demolition, metal/glass/rubber/leather, farms and gardens, residue from sewage treatment. Liquid waste like bio-medical, sewage waste, leachate waste is also collected. Solid waste is a waste, which is in Solid State, arising from domestic, trade, industrial, agriculture, mining, construction activities, and from public services. Solid Waste Management (SWM) is a system which includes the generation of waste, storage, collection, transportation, processing and final disposal of the solid waste. Solid Waste Management (SWM) service is provided by Urban Local Bodies (UBL) in India Rates and compositions of solid waste management vary from one nation to other which depends on life style, structure of industry, waste management rules. Local bodies have to be serious in following all the legal aspects of waste management so that it can be helpful to the surroundings and health of the public. Local bodies have also made some of their own rules for efficient waste management in their city. The aim of solid waste management is to control, collect, process and utilize and disposal of solid waste by gaining economic benefit from it in order to protect the health of the public and the environment of the city/state/nation.

VII. SOLID WASTE GENERATION:

SMC is responsible for the management of solid waste generated in the city. The city administration has been decentralized in 7 zones. Total waste generation rate is more than 1550 MT per day.

VIII. SYSTEM OF WASTE COLLECTION AND TRANSPORTATION:

(A) PRIMARY COLLECTION & ITS TRANSPORTATION

Generation of waste in Surat city is collected by corporation authorities. SMC has sufficient staff to keep the city clean by sweeping during day, by lifting the container, door to door collection system, night scraping and brushing activity. The waste generated is collected daily with the use of vehicles like truck, dumper placer, compactor, tempo etc. It has been observed

² EnviroLiteracy.org

³ Britannica.com

many times staff is not collecting waste in some of the areas and residents have complained for the same and SMC is taking these complaints seriously. Most of these vehicles carry the waste in open manner creating nuisance of order and while collecting waste from one place to another during that time also flies, mosquitoes, insects etc. roam around the vehicles and waste which can be injurious to the public health. SMC can cover some part of the vehicle in which they keep waste so that no disease is spread among the areas where they roam for waste collection.

(B) SECONDARY TRANSPORTATION

Surat has 6 municipal zones and 6 waste transfer stations. All the zones are required to transfer all sorts of waste collected in their respective zones and accordingly processing of waste is to be done. The waste which cannot be recycled or reuse is sent to land disposal site in Khajod village at the outskirts of the city. Daily tons of waste is disposed in this site and

Municipal Solid Waste collected through primary collection system reaches to the Semi closed body transfer station of the respective zone from where it is being sent to the Khajod Disposal transported through close body container in a mechanically compacted way. All the zones are supposed to function their work on daily basis and in all their working days no inefficiency from each zone will be entertained by SMC.

Name of Transfer Station	Zone
Bhatar	South West
Katargam	North & Central (Part)
Varachha	East
Anjana	South- East
Pal	West
Bhesan	South

Door to Door collection system by SMC					
Sr.	Period	No.	of	Total	Average MSW collection in

No.		Vehicles Utilized	Trips	MT / Day
1	Jun-14	310	779	1102.14
2	Sep-14	311	746	974.988
3	Dec-14	313	788	878.038
4	Mar-15	315	782	910.767
5	Jun-15	317	835	1180.71
6	Sep-15	317	804	948.116
7	Dec-15	288	733	831.339
8	Mar-16	320	811	953.834
9	Jun-16	319	843	1160.89
10	Sep-16	321	819	961.155
11	Dec-16	321	807	924.52
12	Feb-17	321	829	941.033
13	Mar-17	320	833	994.265
14	Jun-17	325	870	1170.72
15	Sep-17	330	869	1018.84
16	Dec-17	407	1040	1044.61
17	Mar-18	421	1059	1028.37
18	Jun-18	425	1144	1339.29
19	Sep-18	433	1169	1265.44
20	Dec-18	464	1560	1509.6

Source of the above data: Surat Municipal Corporation Website.

To comply with the MSW Rule 2000, Door to Door garbage collection system is made operative from 2004 in six zones covering almost whole area of the city. There are seven different agencies working in six zones. The management of Hotel-Kitchen waste was introduced in the year 2000, in which hotel kitchen waste is collected and transported by the hotel association. They have deployed 18 vehicles for it and total hotels and restaurants in Surat are around more than 800. Hotel waste collection is collected separately.

IX. “ANUDAN SCHEME”⁴ FOR URBAN DWELLER UNITS

For the best coverage of SWM services and to have good sanitation, SMC started Anudan Scheme on 25th July 2012 which was implemented by the authorities of the corporation to involve public for internal cleaning and garbage collection. The scheme covers area of more than 5 lakhs sq. mt. SMC makes payment to residential and non-residential society at 60 paisa and 65 paisa respectively to keep the city clean. At present under this scheme, more than 862 societies are taking benefit of the scheme. For proper implementation of this scheme and to reach this scheme to the public SMC had given employment to around 850 people. Around 1600 Rs can be earned by any society if it takes benefit of this scheme and this activity was controlled by the President of the colonies. This scheme has been one of the key steps taken by SMC for making public serious about this issue and to have their participation. This scheme has benefitted many people and colonies but during the early years when it was new but now very less people or colony is taking benefit from this scheme which should be entertained by the local body and more and more people as well as colonies take benefit of this scheme should be encouraged.

X. MODERNIZATION OF REFUSE TRANSFER STATION

SMC has six transfer stations and all the stations are in operational on daily basis. SMC had planned in the year 2014 to have modern transfer stations which started operating from March 2015 at four places namely Dindoli, Gaviyar, Simwada and Kosad. Such station has benefitted the local bodies. SMC is planning to develop more such stations in order to have efficient waste management.

For door to door collection system and sweeping activities the vehicles that are used are transferred to such stations by primary transportation. Secondary Transfer Vehicles work is to reach directly to the land disposal site.

Primary vehicles which collect waste from door to door are supposed to pass through

⁴ www.suratmunicipal.gov.in

elevated platform via ramp and chutes. All secondary vehicles are kept under these chutes. Municipal Solid Waste is under loaded from primary vehicles and transferred to closed containers. Fibred Rain forced Sheet (FRP) is kept in order to protect the entire area o chute and entire structure is covered by the concrete blocks. Hook lifting vehicles are used for transferring waste collected from one place to another. Leakage proof door collection system is used so that the station is kept clean where waste is stored.

Waste collected through vehicles will be sent to the closed containers. Spillage of garbage is protected. Transfer Stations are semi-closed. Secondary handling of Municipal Solid Waste is stored and transferred to containers. Such waste handling area is to be free from flies and their nuisance and strict restriction of animals is must in transfer stations. Leachate system has been separately installed by SMC.

XI. DISPOSAL

Municipal Solid Waste collected through primary collection system reaches to the Semi closed body transfer station of the respective zone from where it is being sent to the Khajod Disposal transported through close body container in a mechanically compacted way. Daily tons of waste is being disposed at the land disposal site. Waste is just being thrown at the site without segregating which waste is useful and which is not. SMC must segregate the waste and should take advantage of some of the waste if they can be used again by recycling. SMC collecting tons of waste daily is in search of more land disposal sites which is not a positive approach by SMC.

XII. INITIATIVES FOR PUBLIC AWARENESS

Public education is most important component for achieving storage of waste at source and for that two separate waste bins are to be kept at home, one for wet and another for dry waste. SMC initiated public awareness by giving advertisement in the local news- paper, television, cable television, cinema theatres, radio and web sites. It also conducts seminars in schools and societies to bring awareness about the cleanliness. It has also distributed waste bins to public at free of cost to segregate the wet and dry waste at source itself. SMC has to keep more public awareness programme for efficient waste management. It is not creating awareness on a large scale of people and is hindering the process of proper waste management in the city. NGO's should be developed who work for such environmental issues that can easily contribute the local bodies in order to achieve their safe environmental goals. In India every city is lacking in creating public awareness for any environmental issue which needs to be changed by putting more and more efforts by concerned authorities. If the

public is no being serious this important issue than strong legislation and efficient staff of the local bodies will not be able to work properly as the main player in the entire process is not worries about it. All the plans made for proper waste management if the public of the region is not participating in helping local bodies for good management of waste in the city.

XIII. APPROACHES TAKEN BY SURAT MUNICIPAL CORPORATION⁵

SMC has determined a three tiered approach for managing solid waste. Each of these should be practiced to reduce the amount of material headed for final disposal. They are as follows:

- **Reduce** :The best way to manage waste is to not produce it
- **Reuse** : It makes economic and environmental sense to reuse products
- **Recycle**: Recycling is a series of steps that takes a used material and processes, remanufactures, and sells it as a new product.

These three tiered approach is not at all implemented in the city and no one cares about its proper execution. This approach will be helpful for the city's healthy and safe environment so SMC should understand and have its implementation rather than having it just on paper. This approach is something which is not at all implemented in the entire Gujarat state and it will be a golden opportunity for SMC to be the first one to have its execution.

XIV. LEGAL ASPECTS:

(A) SWM RULES, 2016⁶

1. Waste segregation is the duty of the waste generator to segregate the waste.
2. Local bodies are strictly advised to follow the door to door collection of waste on daily basis.
3. Waste collected by sweeping activity carried out in any city/town/village is to be kept separately
4. To set up facility of sorting waste and to have material recovery facility.
5. Setting up different centre of deposition for various wastes like e-waste, bio-medical waste, hazardous waste etc. For safe storage of such waste and transportation of the same
6. Segregated bio-degradable waste to the compost plant of the city.
7. Segregated non-bio degradable waste to their respective processing unit or material recovery plant. Proper construction of disposal site and transfer station.

⁵www.suratmunicipal.gov.in

⁶www.indiagov.in ministry of environment and forests

8. Waste disposal process should be carried in such a manner that only non-usable, non-recyclable waste, non-reactive waste, non- bio degradable waste etc. should only be allowed to dispose to the land disposal site. Construction and Demolition of waste is to be disposed by waste generator as per his duty.
9. Proper allocations of funds are required for proper waste management in any region. These funds should be exclusively used for waste management purpose only. No misuse of these funds is to be tolerated by the concerned authority.

(B) LAWS RELATING TO WASTE MANAGEMENT IN INDIA:

1. **The Waste Act, 1974:** The main objective of this act is to create for protection and control on water pollution in the country. This act gives power to Centre and State Boards to monitor regulate and restore the quality of water in order to prevent and control water pollution and penalize the defaulters.
2. **The Water (Prevention & Control of Pollution) Cess Act, 1977:** This act was brought in regard to levy cess on Municipal Solid Waste Management (MSWM) and cess on consumption of water for sanitary land filling, composition etc.
3. **Hazardous Waste (Management & Handling) Rules, 1989:** This act gives us a list of processes that generate hazardous wastes and also gives information regarding collection, treatment, storage and disposal of hazardous waste.
4. **The Bio-Medical Waste (Management & Handling) Rules, 1998:** This act was brought with the aim to have legal binding on all the health care institutions of India and all their waste of medical should be handled by segregating disposal of it and some of them even recycled if possible.
5. **The Batteries (Management & Handling) Rules, 2001:** This act main aim was to bring in notice to all the manufacturers, dealers, retailers, importers etc. who are involved in the process of manufacturing, sales, purchase and to regulate and ensure the safety of environment by proper disposal and battery use.
6. **Plastic Waste (Management & Handling) Rules, 2011:** These rules were amended from earlier rules of 1999. These rules guide us to have plastic bag comprising of 40 microns rather than 20 microns. These rules also put restrictions on consumers from getting plastic bags while shopping at free of cost. These rules restrict usage of harmful recycled plastic and practice of food packaging from hotels and restaurants.

7. **E-Waste Rules, 2011:** These rules give us the definitions of various wastes like historical e-waste, electronic and electric waste, etc. The producer is solely responsible for recycling or disposal of e-waste generated from end of line of their products making and bringing one principle of 'Extended Procedure Responsibility'.

SMC is not at all following all the above rules which are made for better waste management in any region. It is expected from all the municipal corporations of the nation to follow all these rules so that they can have safe and healthy environment in their region. Disease will be reduced and there will be protection of public at large scale. Local rules should be made by local bodies if they are not able to all the rules which are centrally applicable to all regions.

XV. CONCLUSION

Surat is a leading urban city in India. There is a dire need to educate and make aware the people to change their habits, so as to store waste at source, and dispose of the waste as per the direction of Municipal council and effectively participate in the activities of Municipal council. Clear guidelines relating to the kind of storage receptacles, segregation of waste etc. should be issued, offenders should be penalized. There should be segregation of non-biodegradable /recyclable waste at sources or at secondary collection point and methods like compositing should be used for biodegradable waste. All the domestic hazardous waste, electronic equipment waste should be stored in bags / sacks and should be disposed in notified safe areas. Separate community bins should be provided for dry and wet waste. For commercial areas and hotels the dustbins should be containers not more than 100 lts in size with handles on top or on sides with rim at base. In case of vegetable markets large containers complementing the transportation system should be provided. For waste in meat and fish markets the containers should be non-corrosive and not more than 100lts. Biomedical waste from hospitals and nursing homes should be treated as per the provisions contained in Government of India , Ministry of Environment and Forest Biomedical wastes (Management and Handling) Rules -1998 . Wastes from construction sites, Demolition waste should be within the premises and not at all obstructing the road. Door step collection of waste by municipal workers and commercial areas should be ensured. It is the duty of the waste generator to segregate the waste at source by keeping separate bins for dry and wet waste at their places. SMC is not taking this issue seriously and they are facing many problems in order to have proper waste management in the city. SMC is also trying to earn money from some of the waste which can be sold or sold after recycling process but that should be encouraged more and more so that they don't have to allocate funds every year in huge

amount and income generated from such waste can be used for better waste management. It has been observed that not only SMC but almost all the city's municipal corporations are facing issues in managing tons of waste collected on a daily basis. They don't do it in a proper manner and the ultimate sufferer of their fault will be the health of the public in that region.

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