

Municipal Solid Waste Management System in Salem District

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Abstract - Solid waste management is all about every city government provides safety sanitation of waste for its resident's, and municipal authorities are responsible for such service. While service levels environmental impacts and costs vary dramatically from different cities, however, in India it is one of the worthless services, since the authorities apply unscientific outdated and inefficient system to collect and dispose of the solid waste causing hazardous to its inhabitants. The various study reveals that about 90%of solid waste is disposed unscientifically. The present municipal laws are inadequate for the provisions of disposal of Municipal solid waste. The current situation is becoming more critical with the rapid urbanisation. The segregation and the sorting are done in an unorganised sector. If the separation and the sorting are done efficiently the yield of recycling materials will be high. The MSW disposal is possible with low cost through smart compression and transporting techniques. The present study deals with the detailed study of solid waste management of Salem city Tamil Nadu India which has 91.34sqkm area and 8,34,792 population as per 2011 census.

index terms: solid waste, population, waste collection disposal

I. INTRODUCTION

Providing excellent sanitation to the people in the environment is the primary goal of all the solid waste management programmes. To evaluate the direct and indirect effects caused by improper collection and disposal of solid waste, it is essential to create awareness among the people towards cleanliness. In India increase in population is gaining more importance towards Municipal Solid waste when compared to other countries. For municipal solid waste management in India, it is necessary to develop appropriate rules and regulations technologies for its safer disposal. Municipal Solid Waste Management is the primary issue and challenging aspect of fast-growing smart cities like Salem. Unpredictable waste disposal due to population and business incensement in and around the study area will lead in the uncontrolled way of disposal of MSW are result in massive environmental sustainability issues regarding social, physical, biological and ecological terms.

II. DETAILS OF THE STUDY AREA:

The Salem city municipal corporation has 91.34 sq km area. In which there are 60wards, and the total population as per 2011 census is 8,34,792 and floating people in the city are 1,10,000/day. The entire road length of the Salem city is 811.90km and width of a drain in the town are 1023.63km in which there are 181slums, 12daily markets, 6weekly markets, two bus terminals one is for local transportation and another one is for inter and intrastate.

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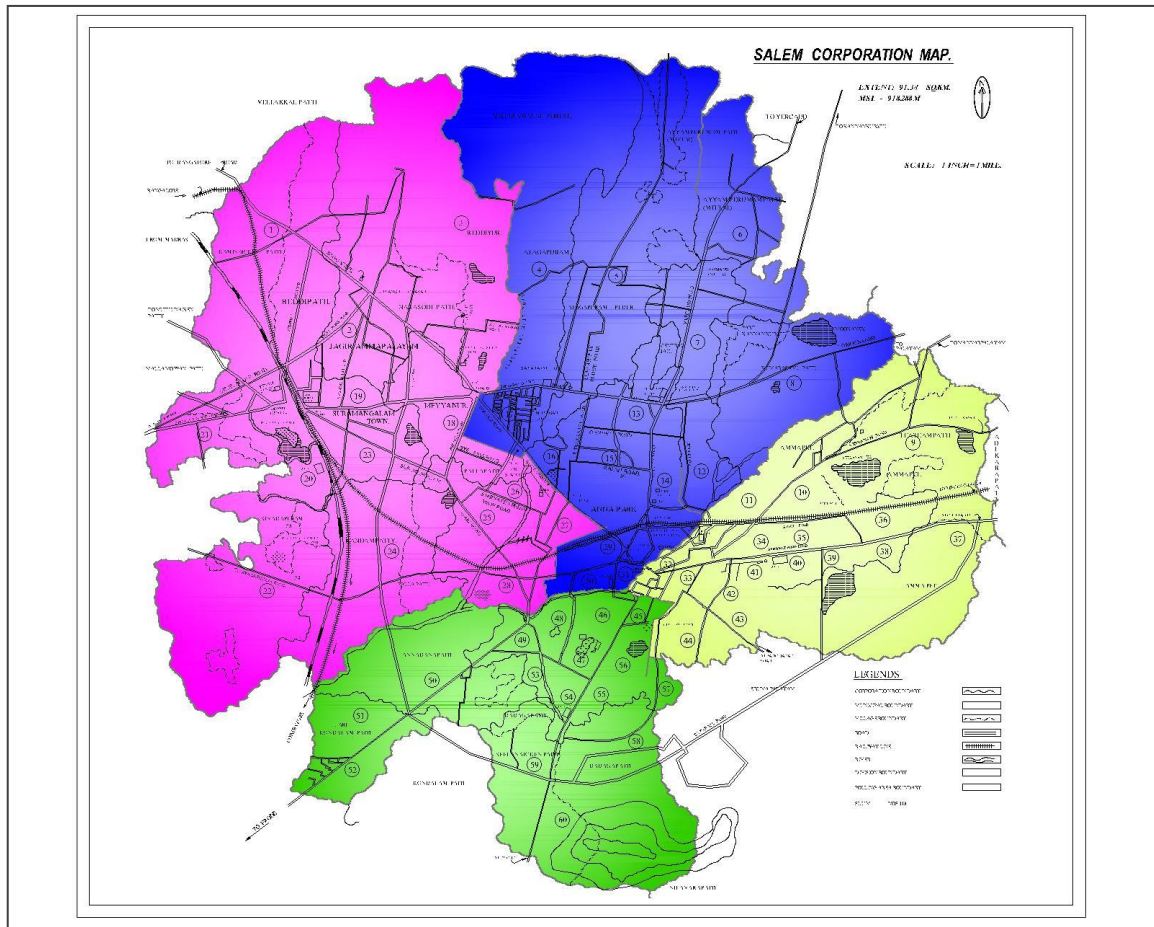


Fig. 1 Salem City Corporation Map

III. SOURCES OF WASTE GENERATION IN SALEM CITY

The waste creation speeds in the Tamil Nadu are moderate compared to the low-income cities in the several other parts of the nation and remarkably lower than the developed cities. Due to lifestyle transitions, particularly in the booming cities, to the use of more packing material has increased and hence the per capita, waste production is growing by about 1.3 percentage per year. The properties cardboard, etc., and household hazardous wastes. The second principal source of waste generation in the city holds of industrial waste which arises from hotels, restaurants, stores, office, markets, etc. There are approximately 3000 hotels in the city which produces around 5% of overall MSW in the Salem city. The third principal source is inert waste and silt.

TABLE 1. THE GENERATION OF SOLID WASTE IN SALEM DISTRICT

SOURCES	% OF GENERATION
Residential	55
Commercial	25
Silt inert	20

IV. CHARACTERISTIC OF MSW STUDY AREA.

Solid waste usually called the third pollution behind Air and water pollution is that the material which results from the different human actions and which is dispersed as un waste. The properties of municipal solid waste vary significantly

of the solid waste in a city may vary depending on the geographical location and the population size. The production of urban waste is increasing with growing use of packaging material and plastics yet than expanded cities.

The ultimate origin of waste production in a city is from the residential system, which consists of both non-degradable and degradable waste such as paper, food waste, textiles, plastics, with time. The classification of the solid waste can is explained below:

a. Inorganic waste:

The mineral waste consists of inflammable substances such as mud, dust, grit, metal pieces, broken glass, metal containers, waste building materials, etc., and is not constrained to decay and, hence, not detrimental to public health.

b. Organic waste:

This waste is restrained to deteriorate with time and produce extremely unpleasant gases and odour which are very dangerous to health. It breeds flies, mosquitoes which develop diseases like diarrhoea, typhoid, etc.



Other classification

- Municipal waste.
- Construction and demolition waste.
- Garbage.
- Hazardous waste.
- Biomedical waste/hospital waste.
- Commercial waste.
- Plastics.
- Industrial waste.

c. *Municipal waste:*

Municipal waste is the waste accumulated from local residential and nonresidential actions such as dead animals, market wastes and street wastes

d. *Construction and demolition wastes:*

Demolition of construction wastes are the waste substances produced due to building repair and construction of many structures. It contains stones, concrete, earth, bricks, plumbing materials, timber, roofing, etc.

e. *Garbage:*

Garbage is a term related to animal and vegetable waste emanating from the storing, handling and cooking of food.

f. *Hazardous wastes:*

Hazardous wastes may be expressed as wastes from industrial, institutional, or consumer source which because of their physical or biological, characters are probably vulnerable to humans and the ecosystem.

g. *Biomedical /hospital waste:*

Hospital waste is produced during the examination, surgery, or immunisation of human beings. It may hold wastes like sharps, disposables, solid waste, cultures, anatomical waste, chemical wastes discarded medicines, etc.

h. *Commercial waste:*

The waste from offices and retail stores, restaurants, hotels, and warehouse are classified as industrial waste.

i. *Plastics:*

Plastics, due to their variety of practice and influence on the environment can be listed under a unique category of solid waste.

j. *Industrial wastes:*

Industrial waste is that waste generated by industrial actions which comprise any substance that is represented unusable during a production process from industries, mills, factories and mining processes.

TABLE 2: TOTAL GENERATION OF SOLID WASTE IN SALEM CITY.

Description	Composition %
Green Waste	63
Plastic Waste	12
Inert Materials	9
Food Waste	8
Paper Waste	6
Bags, Leather, Metals	2

Biodegradable waste – 53	230 MT/day
Bio Methonisation Potential Waste	35 MT/day
Non- Biodegradable waste	110 MT/day
Silt/Inert	75 MT/day
The quantity of waste generation per day	450 MT/day

TABLE 3: THE COMPOSITION OF SOLID WASTE IN SALEM CITY

V. SOLID WASTE COLLECTION SYSTEM:

Following are the classification of

i) Collection system Based on the availability of service:

a. *Community bins:*

Public deliver their garbage to the community bins that are placed at fixed points in any locality. MSW is accumulated up by the municipality or its designate according to an organised schedule.

b. *Curbside pickup:*

Public transmit their garbage immediately outside their residence, and according to garbage pick-up schedule



organized with the local authorities.

ii) Collection method based on the mode of operation:

a. *Stationary container system:*

In this method, the box used for storage of waste rest at the point of collection. The acquisition vehicles collect the waste adjacent to the storage bins and then transport them for processing or disposal site.

b. *Hauled container system:*

As empty storage container known as a drop off box is pulled to the storage site to replace the tank that is full of waste, which is brought to the processing point, transfer station, or disposal site.

VI. TRANSPORTATION OF SOLID WASTE The solid waste in the Salem City is conducted by using a tractor, compactor vehicle, dumper placer, tripper lorry, dumper bins, etc. The waste produced could not reach the chosen dumping site, and it is lost in the city peripherals along the road, low-lying area, outskirts and along the drain so on are the likely cause for reduction. In almost all cities data exhibit that uncontrolled open dumping is a regular feature. The table describes the data of the present state of collection and transportation of MSW.

TABLE 4: PRIMARY COLLECTION

Type of vehicles	Total number of Vehicles in use
Pushcart	161
Pushcart bin	644

TABLE 5: SECONDARY COLLECTION

Types of vehicles	Number of vehicles	The average weight of waste transported	No of trip per day

The following are the types of disposal of solid waste:

- Sanitary landfill.
- Composting
- Open dumping
- Burial.
- Incineration
- Manure pits.

a. *Sanitary landfill*

Sanitary landfills are places where waste is separated from the atmosphere until it is safe. It is recognised when it has deteriorated biologically and chemically.

b. *Composting*

The aerobic process of Composting of waste comprises of the decomposition of organic waste into humus known as manure which is a good fertiliser for plants. Nevertheless, the term "composting" is used globally with different meanings.

c. *Open dumping*

The satisfactory sanitary landfilling ability for any Urban Local Bins is not possible, and MSW is discharged in the outskirts of town along the roads. Due to percolation of

		per trip in MT	
Tripper lorry	08	09	2
Dumper placer	12	12	5
Compactor	16	16	2
Tractor	31	1.50	2
Dumper bins	132	0.75	1
Compactor bins	330	0.30	1

VII. RECYCLE AND REUSE

For producing new products, this requires actions like gathering those elements from the waste which could be profitably recovered and utilised. Optimal recycling is not conceivable since unsegregated waste is deposited in the community boxes, nevertheless for selling recyclable substance like plastics, glass, etc. pickers usually sort it out and take it. In Salem city, the rag pickers sorted out around all the recyclable substance and absorbed in the material through recycling.

VIII. DISPOSAL

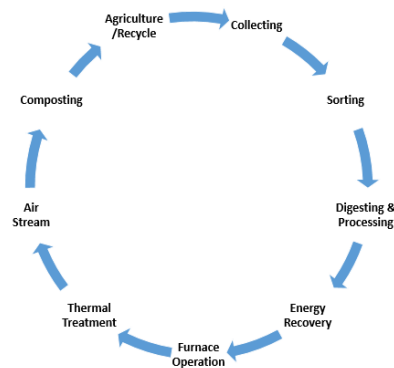


Fig. 2. Disposal

leachate, unscientific dumping is likely to flooding and vital source of surface water pollution during monsoon.

d. *Burial*

Burial is the placing of waste in human-made or natural removals, such as pits or landfills. Burial is the most conventional inland disposal method used for disposing of drilling wastes. In some oil field areas, large dumps are performed to dispose of oil field wastes from multiple wells.

e. *Incineration*

Incineration is a waste handling method that comprises the combustion of organic materials collected in waste substances. Incineration and other high-temperature waste processing methods are designated as "thermal treatment." Incineration of waste materials transforms the waste into ash through heat.

f. *Manure Pits*

This method of waste disposal could be followed by the rural areas. excavated and the cattle dung, residences in the Pits could be near the house, wastes such as kitchen wastes,



animal feeds and leaves could be discharged into them.

IX. DISPOSAL METHODS ADOPTED IN THE SALEM CITY

The solid waste is obtained from the city and transported to the site if disposal which is located in Chetchavadi where they practice open burial system without segregation of waste, Which is highly not suggested to dispose of the solid waste. During earlier days the Salem corporation was disposing of their solid waste in Erumapalyam and Suramangalam where the people started to protest due to improper maintenance of the landfill which began outflowing with the span of ten years. To avoid this problem the municipal authorities, need to take the necessary steps and start the scientific method of disposal of solid waste.

X. CONCLUSION

Lack of improper measure from the municipal authorities there is a lack in the substantial waste collection and disposing of in the city. Municipal Solid Waste Management is the primary issue and challenging aspect of fast-growing smart towns like Salem.

Unpredictable waste disposal due to population and business incensement in and around the study area will lead in the uncontrolled way of disposal of MSW are result in massive environmental sustainability issues regarding social, physical, biological and ecological terms.

The accurate data about effective MSW management and economic cum adoptable techniques identifications are in progress.

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