iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 4 **Issue:** II **Month of publication:** February 2016

DOI:

www.ijraset.com

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Volume 4 Issue II, February 2016
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Municipal Solid Waste Management in Sriperumbudur, Kanchipuram District

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Abstract--Management of municipal solid waste is the major challenge in many countries. Even from a small municipality to the metropolitan cities in India are struggling to manage the municipal solid waste. In 2013, the total MSW generated by 14.12 million people living in urban areas was 4837 metric tonne/ day . The open dumping and landfill leads to the various pollution such as air, land and water by the leachate comes from the waste. For doing the various disposal methods other than landfill, segregation process needed as the important one in municipal solid waste management. Our government spend more of the money for this segregation process only. This paper deals with the municipal solid waste management in which segregation done as source segregation and also maximum utilization of municipal solid waste in Sriperumbudur town panchayat, Kanchipuram district.

Keywords---Municipal Solid Waste Management, source segregation, various composting, scientific landfill.

I. INTRODUCTION

Rapid increase of population leads to the increase of waste. Especially in the case of municipal solid waste all the wastes are combined together with the household wastes .Commercial wastes, industrial wastes and household wastes are the composition of municipal solid waste recently. Common method of disposal of municipal solid waste is dumping in our country or stored them in an open space land. Even though some of the wastes can be recycled by us, segregation of the recyclable and reuse materials from the municipal solid waste collection is the challenging work in all the places of our country. According to Municipal Solid Waste Management 2000 rules, there are many rules for handling, segregation and disposal of the municipal solid waste. But in our country due to lack of landfill and increasing urbanization these rules are not followed in maximum of places. In this paper , the effective method of municipal solid waste management in a town panchayat is to be studied.

II. STUDY AREA

The effective municipal solid waste management is to be studied in a town panchayat named as “Sriperumbudhur” in Kanchipuram district. The location of sriperumbudur is 12.97 ○ N 79.95 ○ E in Tamilnadu.

Table 1.1 General Details of Sriperumbudur Town Panchayat

Name of the panchayat	Total population as on	No. Of wards	Commercial and road cleaning wastes	House source and biomedical waste	Total quantity of waste
Sriperumbudhur	25,366	15	6 tonnes /day	5 tonnes/day	11 tonnes/day

III. COMPOSITION OF WASTE

Biodegradable waste - 60 %

Recyclable waste - 20 %

Inert waste - 20 %

Volume 4 Issue II, February 2016
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Table 2 Waste Characterization: Weighing Date: 9.3.2015

S.no.	Types of waste	Amount in kg / day
1.	Organic	2885
2.	Oil cover	11
3.	Milk cover	25
4.	Pet bottles	33
5.	Carry bag	410
6.	Cotton box	90
7.	Paper	190
8.	Metal	164
10.	Thermocole	15
11.	Cloth	65
12.	Tyres	30
13.	Jute Bag	18
14.	Coconut shell	58
15.	Landfill	960

IV. MANAGEMENT OF MUNICIPAL SOLID WASTE

A. Collection

Collection is done by two processes. They are primary and secondary processes. The primary process includes the door to door collection and the secondary collection is the collection boxes in the corner of each street. There are 36 labours are worked for this collection process alone. The collection is done by three types of vehicles. They are tricycle, push cart and a small truck (TATA ACE). The wastes collected from door to door is then totally put into the secondary collection boxes in each street

Table 3.1 Primary collection vehicles

S.no.	Name of the panchayat	Types of vehicle	Available	No. Of trips / day	Capacity of vehicle
1.	Sriperumbudhur	Tri- cycle	5	1	250 kg
2.		Push cart	5	2	150 kg
3.		Small truck (TATA ace)	4	1	1 tonne

Figure 3.1 Collection Vehicles

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ISSN: 2321-9653
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Figure 3.2 Collection Vehicles

Table 3.2 Secondary Collection

S.no.	Name of the panchayat	Types of vehicle	Available	No. Of trips / day	Capacity of vehicle
1.	Sriperumbudhur	Tractor	1	1	5 tonne

B. Segregation

Segregation is the main part in the municipal solid waste management processes. Here the segregation part is the most important part to be explained. Because the segregation is done here at the source itself. People in this town panchayat dispose there house hold wastes in a segregated manner. They separate the wastes as degradable and non degradable themselves in the houses and also the labours separate the wastes while without the segregation done by the people. So, the big process segregation is done easily here as the primary process.

Table 3.3 Details of Workers in Segregation

Segregation method	Total no. Of workers	No. of workers involved in segregation	No. of workers in compost yard
Source segregation	40	36	4

C. Treatment

Resource Recovery Park is the place where the treatment process of the collected and seggregated waste is going on.Under the scheme of URBAN INFRASTRUCTURE DEVELOPEMENT SCHEME IN SATELLITE TOWN the resource recovery was established. This park is used to recover the usefull materials from municipal solid waste of Sriperumbudhur town panchayat area. There are many processes held in this park. They are as follows.

Windrow method
Biocompost
Vermicompost
Vermiwash
Plantation of medicinal plant
Storage of recyclable materials
Dumping of wastes
Scientific landfill

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Table 3.4 General Details of Resource Recovery Park

Total area of resource Recovery Park is 40468.56 m^2

S.no.	Separations in recovery park	Area
1.	Windrow yard	6071 m^2
2.	Bio compost yard	446 m^2
3.	Vermi compost yard	446 m^2
4.	Area of plantation	
	For medicinal plants	223 m^2
	For agriculture	20234.28 m^2
5.	Area for storage of recyclable materials	175 m^2
6.	Collection vehicle shed	179 m^2
7.	Shed for shredding	461 m^2
8.	Dumping yard	2 acres
9.	Scientific landfill	2925 m^2

1) Windrow Method: This method is a common method of storing the collected solid wastes in all places. In this park there is a wide space of land is provided for the collection of segregated municipal solid wastes. In this method, the wastes are treated in an open space where the temperature is also normal in condition. In this yard, the collected waste are separated by the duration from when they are collected. The water collected from this yard is stored in a tank and it is re circulated to this wastes to keep the moisture. There is a separate tank for leachate collection with the capacity of 12,000 litres from which the water from windrow method is recycled.

Figure 3.5 Windrow Yard

2) BioCompost : Compost is the process of converting the inorganic matter into a useful manure for the land and agriculture. Here, the composting process is done by applying only water and the cow dung to the organic wastes. The duration for this process is 90 days.

Figure 3.6 Bio compost Yard And Beds

3) VermiCompost: Composting in this process is done by using earthworms as a digester of the organic wastes. In this process, the earthworms , water and cow dung are used to convert the organic wastes into humus. This process is applied separately for vegetable wastes.

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Figure 3.7 Vermi compost Bed

4) Plantation Of Medicinal Plants And Small Plants: The remaining wastes after treatment from the organic wastes are used as the manure for nearby waste lands. In this land, they planted small plants such as spinaches and the medicinal plants and also the place is maintained by many of the gardening plants also. It looks like a park so it is named as RESOURCE RECOVERY PARK.

Figure 3.8 Plantation Area

5) Storage Of Recyclable Materials : There is a separate room for plastic waste. There is a separate compatible room is present in this park for recyclable materials. From this rooms, the labours take the recyclable materials and transport them into the private sectors where the recycling process is to be done.

Figure 3.9 Storage Rooms For Recyclable Materials

6) Disposal: The organic wastes are converted into recovered materials. The inorganic wastes are the only problem. These inorganic wastes are dumped in a waste land present in the recovery park.

7) Dumping of Wastes: The inorganic wastes are to be dumped now a days in this park in a separate land. There is no other process for the inorganic processes. This dumping is done in a separate land around the park.

8) Scientific Landfill (For Future): This is the only advanced method is going to be establish in this park. If this process is established then there is the best municipal solid waste management is achieved in this town panchayat. This landfill is designed to dump the inorganic waste. The leachate from this landfill is also tend to be treated in future. There are separate tanks for filtration processes under construction in this site.

Volume 4 Issue II, February 2016
ISSN: 2321-9653
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Table 3.5 General Details of the Scientific Landfill

S. No.	Constituents	Depth
1.	Clay layer (instead of GSCL)	1 feet
2.	HDPE geo membrane (synthetic plastic sheet)	1.5 mm thick
3.	Coarse aggregate	1 feet
4.	Geo textile (a white colored cloth)	
5.	For dumping of wastes	4 feet
	Total depth of the scientific landfill	6 feet

In between the coarse aggregate and the geo textile HDPE pipes with 200 mm dia. are layed to collect the leachate from the landfill.

Table 3.6 Tanks under Construction for the Treatment Of Leachate

S. no.	Name of the tanks	No. of tanks	Dimensions (in m)
1.	Leachate collection tank	1	3×3×1.5
2.	Metal filtration	2	2.5×2.5×1.5
3.	Rapid sand filtration	3	2.5×2.5×1.5
4.	Solar evaporation tank	1	15×15×1.2

Figure 3.10 Scientific Landfill and Tanks

V. DISPOSAL OF SWM DATA

Table 4.1 SWM Disposal Data

Name of the ULB	Total quantity generation	Open dumping if yes mention quantity	Windrow system of composting if yes mention quantity	Biogas	Biogas power plant if yes mention capacity and energy produced in kwH	RDF if yes mention quantity	Waste to energy facility	Scientific closure if any	Landfill
Sriperumbudur	11 tonnes		520 kg / day	_	_	_	_	Under construction	_

VI. CONCLUSION

Thus the management of solid wastes in Sriperumbudhur town panchayat is the best one among the kanchipuram district. Even in all over the chennai also, there are few only doing the perfect management of municipal solid waste management. In future the inorganic wastes will dump in scientific landfill , the leachate which pollute the land and groundwater will be collect in a protective manner . Then the MSW management will be maintained as the best Solid Waste Management in Kanchipuram district.

VII. ACKNOWLEDGEMENT

I would like to thank Mr. Porpatham sir in Town Panchayat office of Sriperumbudur, Kanchipuram district.

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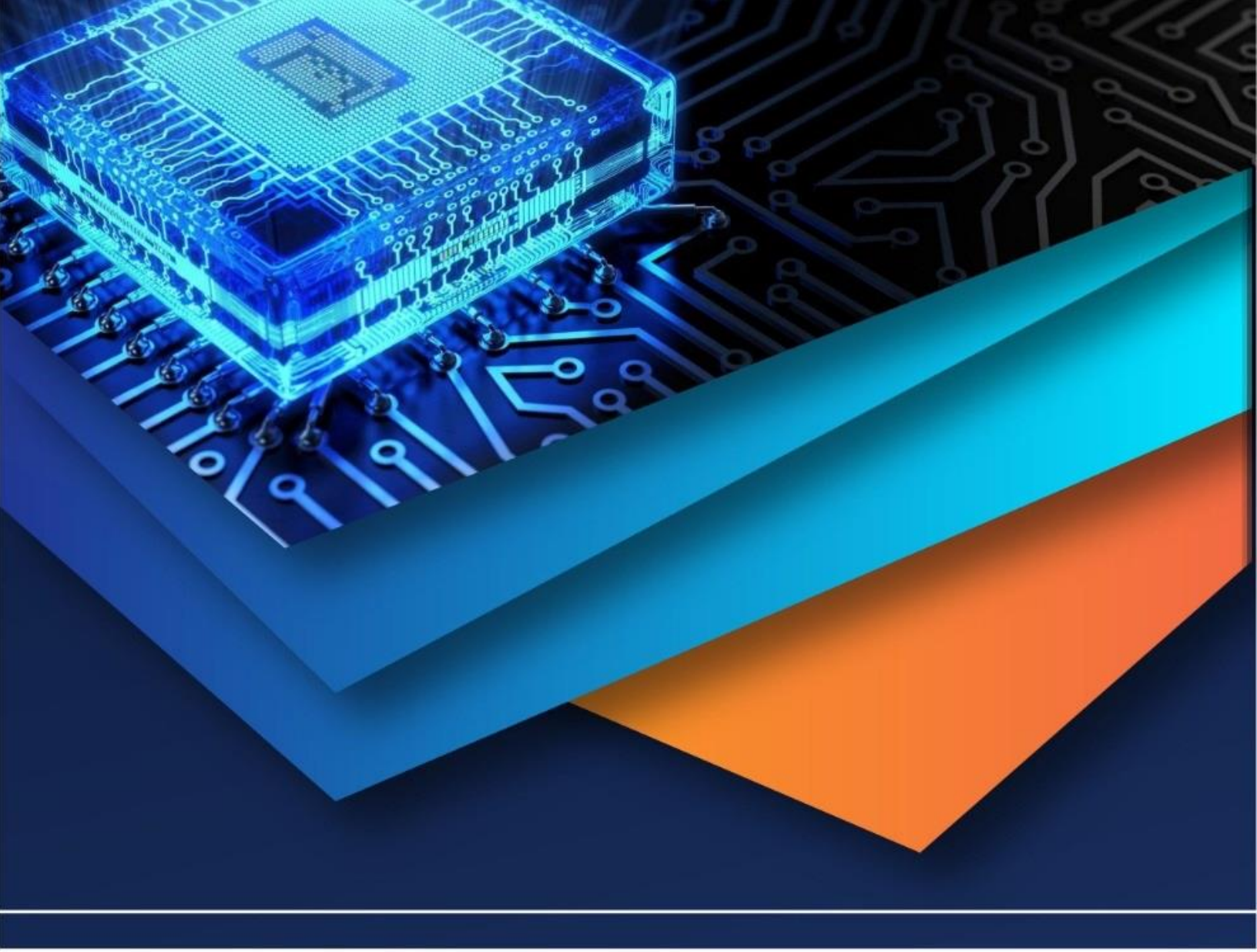

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