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A STUDY ON SOLID WASTE MANAGEMENT IN TIRUCHIRAPPALLI CITY CORPORATION, TAMIL NADU

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Abstract

Solid waste management is one of the basic services planned and managed by the municipal authorities in the country to improve the quality of cleanliness of the urban cities. The main aim is to study the quantum of solid waste generation and to estimate the expenditure incurred and revenue generated from solid waste management in Tiruchirappalli City Corporation.Secondary data was collected from journals, newspapers and published sources of various Municipal Authorities. The study concluded that comparing the four zones, it is seen that Ponmalai zone is generating, collecting and recycling more waste. The reason is that the area is having more industrial units. The expenditure incurred on solid waste management has been increased and revenue was introduced in the year 2018. The major environmental problems include waste collection system, storage, segregation, transfer and transport, solid waste disposal, management of waste water, incineration and open dumping. This has led to rapid industrialization, urbanization, population growth, changes in lifestyle of the people and changes in the economic structure of rural areas are causing environmental pollution. For successful implementation of the municipal solid wastes, public awareness, political will and public participation are essential to have an integrated approach towards sustainable development. If this problem is left unnoticed, it will become a serious challenge for generation to come.

Keywords: Solid Waste Management; Expenditure, Revenue, Urbanization, Solid waste disposal, Incineration.

Introduction

Solid waste management is one of the basic services planned and managed by the municipal authorities in the country to improve the quality of cleanliness of the urban cities. The main aim of solid waste management is the maintenance of clean and hygienic conditions and reduction in the quantity of solid waste which is disposed in the sanitary landfills.

Definition

A solid material that is discarded or thrown away due to no use is called solid waste. According to Sneha Palnitkar (2002) "Solid waste is the term used to describe non-liquid waste material arising from domestic, trade, commercial, agricultural, industrial activities and from public services".

Solid wastes are mainly classified into three types:

1. Municipal solid waste (Household waste)
2. Hazardous waste (Industrial waste and Electronic waste)
3. Biomedical waste (Infectious waste)

1. Municipal solid waste

It is the waste generated out of household activities, construction and demolition remains, sanitation filtrate, and waste emerged out from streets and markets. Municipal solid waste is generated generally from residential and commercial.

2. Hazardous waste

Hazardous wastes are those that may contain toxic substances generated from industrial, hospital, and some types of household waste.

3.Bio-medical waste

It is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining there to in the production or testing of biological.Waste management is a difficult task for any city. It is the responsibility of the city corporation to provide clean and healthy environment. There are various ways to manage the solid waste such as open burning, dumping into sea, sanitary landfills, incineration, composting, ploughing in fields. But these are causing severe environmental problems and health issues.

To commemorate the 150th birthday of Mahatma Gandhi, the Prime Minister of India,Narendra Modi launched"Swachh Bharat Abhiyan" (Clean India Mission) on 2nd October, 2014 to deal with the issues relating to waste management, cleanliness and sanitation at national level.Tiruchirappalli is an upcoming city in Tamil Nadu. The city secured second position in the national SwachhSurvekshan (Clean City Ranking) in 2015.At

present, Tiruchirappalli is in 39th position in 2019.

Review of literature

1. Das et al (2013) in their study focuses on the solid waste management in the Tiruchirappalli city. The waste generation in the city is 435 metric tonnes per day and the Corporation collects 416 metric tonnes daily. The corporation uses manual methods to collect residentialwaste. The corporation uses various push carts, bins and steel containers with different capacities to collect solid wastes. Solid waste generation of the city has increased to 15000 tonnes per year. The study also suggests giving proper education and training that can help people and administration to facilitate proper discharge of waste and its segregation. Financial incentives coupled with education to the recycler scan motivate them for effective waste management services.
2. V. Karthikeyan and Dr. R. Murugesan (2006) analyze the financial impacts of the municipal solid waste generated in the Salem city municipal corporation area and to suggest the methodology for conversion so that revenue can be generated from the solid waste. The duration for converting the municipal solid waste into organic manure can be around 30 days. The net quantity of convertible cost is Rs.3.00/kg and revenue generated is Rs.3,90,744/kg. The recyclables waste generated cost is Rs.30/kg and revenue generated is Rs.88,473.50/kg

Objectives of the study

1. To study the quantum of solid waste generation in Tiruchirappalli City Corporation.
2. To estimate the expenditure incurred and revenue generated from solid waste management in Tiruchirappalli City Corporation.

Methodology of the study

The present study is based on secondary data collected from journals, newspapers and published sources of various Municipal Authorities. Tiruchirappalli City Corporation is divided into 4 main zones namely Srirangam, Ponmalai, Ariyamangalam and Ko-Abishekapuram.

1. To study the quantum of solid waste generation in Tiruchirappalli City Corporation

Table No 1

Solid Waste Generated in four Zonesduring the period 2015-2018

(In metric tonnes)

SlNo.	Name of the Zone	Total quantum of MSW generated in the city		
		2015-16	2016-17	2017-18
1	Srirangam	34,090.58	35,795.11	37,499.65
2	Ponmalai	82,208.78	86,319.20	90,429.66
3	Ariyamangalam	35,148.05	36,905.41	38,662.82
4	Ko-Abishekapuram	40,250.78	42,263.30	44,275.85

[*Source: Annual Report of Solid Waste Management in 2015-18*]
Https//smartcities.data.gov.in

From the Table 1, it is observed that in Srirangam zone, total quantum of solid waste generating in the year 2015 -16 was 34,090.58 metric tonnes whereas in the year 2017-18 it has been 37,499.65 metric tonnes. InPonmalai zone, it is seen that in the year 2015-16 waste generated has been 82,208.78 metric tonnes whereas in the year 2017-18 it has been increased to 90,429.66 metric tonnes. InAriyamangalam zone,solid waste has been generating from the year 2015-16 was 35,148.05 compared to 2017-18 it has been increased to 38,662.82 metric tonnes.InKo-Abishekapuram zone, it is seen that in the year 2015-16 waste generating has been 40,250.78 whereas in the year 2017-18 it has been increased to 44,275.85. By comparing the data of four zones it is found that thePonmalai zone is generating more solid waste.

Table No 2

Solid Waste collected in Four Zones during the period 2015-2018

(In metric tonnes)

Sl. No.	Name of the Zone	Total quantum of MSW collected by the ULB or private operator		
		2015-16	2016-17	2017-18
1	Srirangam	34,074.53	35,778.31	37,482.10
2	Ponmalai	82,172.40	86,281.12	90,389.88
3	Ariyamangalam	35,128.79	36,885.25	38,641.76

4	Ko-Abishekapuram	**40,234.73**	**42,246.50**	**44,258.30**

[*Source: Annual Report of Solid Waste Management in 2015-18*]
Https//smartcities.data.gov.in

From the Table2, it is viewed that in Srirangam zone, total quantum of solid waste collected in the year 2015-16 was 34,074.53 metric tonnes is less compared to the year 2017-18 is 37,482.10 metric tonnes. In Ponmalai zone, it is observed that in the year 2015-16 waste collection has been 82,172.40 metric tonnes whereas in the year 2017-18 has been 90,389.88 metric tonnes. InAriyamangalam zone, in the year 2015-16 solid waste has been collected 35,128.79 metric tonnes whereas in the year 2017-18 it has been increased to 38,641.76 metric tonnes. In Ko-Abishekapuram zone, it is observed that their waste collection has been 40,234.73 metric tonnes in 2015-16 compared to 2017-18 it has been 44,258.30 metric tonnes. By comparing the data of four zones, it is understood that Ponmalai zone is collecting more solid waste.

Table No 3
Solid Waste processed or recycled in four Zones during the period 2015-2018
(In metric tonnes)

Sl. No.	Name of the Zone	Average quantum of MSW that is processed or recycled		
		2015-16	2016-17	2017-18
1	Srirangam	**20,444.71**	**22,182.56**	**24,363.36**
2	Ponmalai	**49,303.48**	**53,494.28**	**58,753.44**
3	Ariyamangalam	**21,077.26**	**22,868.84**	**25,117.14**
4	Ko-Abishekapuram	**24,140.84**	**26,192.82**	**28,767.90**

[*Source: Annual Report of Solid Waste Management in 2015-18*]
Https//smartcities.data.gov.in

From the Table 3, it is seen that in Srirangam zone, total quantum of solid waste recycled in the year 2015-16 was 20,444.71 metric tonnes whereas in the year 2017-18 it has been 24,363.36metric tonnes. In Ponmalai zone, in the year 2015-16 waste recycled has been 49,303.48 metric tonnes whereas in the year 2017-18 has been 58,753.44 metric tonnes. In Ariyamangalam zone, it is observed that in the year 2015-16 waste recycling has been 21,077.26 metric tonnes whereasin the year 2017-18 it has been increased to 25,117.14 metric tonnes. In Ko-Abishekapuram zone, it is observed that the solid waste recycled has been 24,140.84 metric tonnes in the year 2015-16 compared to the year 2017-18 it has been 28,767.90. By comparing the data of four zones, it is found that Ponmalai zone is recycling more solid waste.

By comparing the four zones, it is seen that Ponmalai zone is generating, collecting and recycling more waste. The reason is that the area is having more industrial units.

2. Expenditure incurred and Revenue Generated from Solid Waste

The TiruchiCorporation has introduced user charges in the year 2017-18.The solid waste management user charges are Rs.5/month for a tax assessment of Rs.500.But it varies, commensurate with the property tax of residential buildings. If a resident is liable to pay property tax of Rs.1000 for his house, the charge will be Rs.60/half year.

The charge is being levied to meet a portion of the expenditure incurred towards sanitation initiatives. The expenditure is also used for the transportation cost, conservancy cost and equipment and maintenance cost.

Table No 4
Expenditure and Revenue Data of Solid Waste Management during the period 2015-2018

City : Tiruchirappalli						
	2015-16		**2016-17**	**2017-18**		
Waste generation(In TDP)	460		460	460		
	Expenditure(*In lakhs*)			**Revenue**(*In lakhs*)		
	2015-16	**2016-17**	**2017-18**	**2015-16**	**2016-17**	**2017-18**
Transportation cost	330.00	424.00	602.00	--	--	--
Treatment cost	0.00	0.00	0.00	--	--	--
Disposal cost	0.00	0.00	0.00	--	--	--
Conservancy cost	215.37	443.10	476.55	--	--	--
Equipment maintenance cost	70.38	73.49	16.85	--	--	--

Compost revenue	--	--	--	0.00	0.00	0.00
Recyclable revenue	--	--	--	0.00	0.00	135.98
Power generation from waste – revenue	--	--	--	0.00	0.00	0.00
Users charges - revenue	--	--	--	0.00	0.00	207.87
Others – revenue	--	--	--	0.00	0.00	0.00
Total	**615.75**	**940.59**	**1095.4**	**0.00**	**0.00**	**343.85**

[*Source: Annual Report of Solid Waste Management in 2015-18*]
Https//smartcities.data.gov.in

The Table 4 shows the expenditure and revenue of the solid waste in the year 2015-18. In the year 2015 -16, total quantum of solid waste was 460 metric tonnes and expenditure incurred was Rs. 615.75 lakhs whereas in the year 2017-18, total quantum of solid waste was 460 metric tonnes and expenditure has increased toRs. 1095.82 lakhs. Revenue generated from solid waste in the year 2017-18 was Rs. 343.85 lakhs

Conclusion

Today, the management of solid waste has become the most serious problem. The major environmental problems include waste collection system, storage, segregation, transfer and transport, solid waste disposal, management of waste water, incineration and open dumping. This has led to rapid industrialization, urbanization, population growth, changes in lifestyle of the people and changes in the economic structure of rural areas are causing environmental pollution. The people face great hazards due to improper solid waste management.For successful implementation of the municipal solid wastes, public awareness, political will and public participation are essential to have an integrated approach towards sustainable development. If this problem is left unnoticed, it will become a serious challenge for generation to come.

Reference

1. Urvashi Dhamija, 2006. Sustainable Solid waste Management: Issues Policies and Structures, Academic foundation, New Delhi. Pages 260. ISBN-10: 8171884288.
2. S.C.Bhatia, 2007. Solid and Hazardous waste management, Atlantic publishers and distributors. 552 pages. ISBN-108126908149 :.
3. Https//smartcities.data.gov.in
4. S.Ganesan, "Solid waste management user charges introduced", The Hindu, Tamil Nadu 6 July, 2017.
5. NikhatParvez, Avlokita Agrawal and Akhilesh Kumar2019. Solid waste management on a campus in a Developing country: A study of the Indian Institute of Technology Roorkee, India. Recycling 2019, 4, 28. 1-22; doi:10.3390/recycling 4030028. ww.mdpi.com/journal/recycling.
6. V.Karthikeyan and Dr. R. Murugesan 2006. "Municipal Solid Waste – Impact, conversion and revenue generation", Environment Science and Engineering 'Bulk Drug Industry'. pp. 61-66.
7. Das Swapan and Bhattacharya Bidyut 2013. "Municipal Solid Waste Characteristics and Management in Kolkata, India". International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 3, Issue 2, February 2013, pages 147 - 152).
8. Ashish R. Mishra , Shweta A. Mishra and Anurag V. Tiwari 2014. Solid Waste Management - Case Study. International Journal of Research in Advent Technology, Volume 2, Issue 1, Pages 396 – 399. E-ISSN: 2321–9637.