iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 3 **Issue:** X **Month of publication:** October 2015

DOI:

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

Volume 3 Issue X, October 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Study on Physical Characterization of Municipal Solid Waste at Thanjavur

Vaishali.S[1], Senthamilkumar.S[2]
[1]M.Tech Scholar, [2]Professor, Civil engineering
Periyar Maniammai University,Vallam

Abstract-Huge quantity of wastes like liquid, semi liquid and solid are generated continuously each and every country. Especially the solid waste are the common wastes in this is global. At present in India 188500 tonnes of municipal solid wastes are produced in every day. Following that the disposal of solid waste is the one of the most important criteria in environmental ecosystem. Therefore open dumping of these wastes is creating the environmental problems like leachates. In this study mainly describes the quantity of MSW, solid waste management and physical characterization of MSW at Thanjavur district. Finally the results show the quantity of each waste like plastics, inert materials, papers, organic substances, and glass in MSW.
Keywords: Solid wastes, MSW, Physical characterization

I. INTRODUCTION

Solid waste management is the part of urban and environmental quality management system. This system mainly depends upon the quantity of solid waste and population of particular area and place of disposal area. Solid wastes are threatening the environment and living things. So that the waste minimization or recycling of wastes are the most important role in the environment.Open dumping causes and pollute the land, air and water. Segregation of MSW from the source means it will reduce the quantity of environmental problems. If reusing and recycling the wastes into the wealth also be reduced the quantity of MSW. Energy conservation from the MSW is acting a main role in environmental and ecological system. In India the biomethanation plant are used in MSW recycling and energy conservation process. It will convert the wastes into the energy. From that the methane gases are produced from the MSW and it's a having a number of segregation process and recycling units. India's urban population was 285 million in 2001 and increased to 377 million in 2011. Indian urban population is greater than the total population of USA (308.7 million), the third most populous nation. The quantity of MSW in India at last year 68.8 million tonnes per year.

II. THE STUDY AREA

Thanjavur formerly Tanjore is a city in the south Indian state of Tamilnadu. Thanjavur is an important center of south Indian religion, art and architecture. It was selected as a case study because it is an important agricultural centre located in the Cauvery delta and is known as the Rice bowl of Tamilnadu. It is a major Paddy city in Tamilnadu located on Coordinates 10.47°N and 79.8°E with a total area of 36.33 square miles (14.03 square miles) in the southern area of the country. Thanjavur have a population of 222943 in 2011.



Fig.2.1 Solid wastes at Thanjavur

©IJRASET 2015: All Rights are Reserved

Volume 3 Issue X, October 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

III. MUNICIPAL SOLID WASTE

A. General Particulars

General particulars shows the details of the population of Thanjavur city municipal corporation and number of households. These details are collected from the Thanjavur municipal office. The weight of total garbage's developed in Thanjavur was 110MT at 2015.

Table 3.1: General Particulars

SI.NO	NAME OF THE ULB	PRESENT POPILATION AS ON 2011 CENSUS	NO.OF HOUSEHOLDS	TOTAL ROAD LENGTH IN KM	TOTAL GARBAGE GENERATION IN MT
1.	Thanjavur city municipal corporation	223619	56701	302.491	110

B. Primary Collection

Primary collection is the initial process of collecting a solid waste from the households. At this type of collections three types of vehicles are used they are pushcart, tricycle and mini auto. Those vehicles are collected the solid wastes from the Thanjavur at 1 to 3 times per day. The quantity of wastes collected per day by pushcart was 23MT and by mini auto was 18MT.

Table 3.2: Primary collection of solid wastes

PRIMARY COLLECTION										
S.NO	NAME OF THE MUNICIPALITY	TYPE OF VEHICLE	REQUIRED VEHICLE AS PER NOMS	AVAILABLE	SHORT FALL	VEHICLE CAPACITY IN MT	NO.OFTRIPS PER DAY	QUANTITY GENERATE D PER DAY (IN M.T)	QUANTITY COLLECTED PER DAY (IN M.T)	ACTION TAKEN TO OVERCOME SHORTFALL
1	Thanjavur city municipal corporation	pushcart	200	120	0		1	-	2.3 MT	-
		tricycle	-	-	-		-		-	-
		Miniauto	13	12	-		3		18 MT	-



Fig.3.1.Primary Collection Process by Using Mini Auto

©IJRASET 2015: All Rights are Reserved

Volume 3 Issue X, October 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

C. Secondary Collection and Transportation

In secondary collection Tractor, Auto, Tipper Lorry, Dumper placer, Compactor, Refuse collectors and M.T.L are used to collect the solid wastes. The capacity of Auto and tipper lorry was 1.5MT and Dumper and M.T.L was 1M.T and Compactor was 7M.T.These vehicles are collected the solid wastes from the house holds 3 to 8times per day. Quantity of solid wastes varying up to 4M.T to 36M.T.



Fig.3.2.Secondary Collection Process by Using Tipper Lorry

Table 3.3: Secondary collection and Transportation

SWM DATA 2015										
D. Secondary collection and transportation										
S.NO	NAME OF MUNICIPALITY	TYPE OF VEHICLES	VEHICLE		VEHICLE CAPACITY IN VOL	VECHICLE CAPACITY IN MT	NO.OF TRIPS PER DAY	QUANTITY COLLECTED PER DAY MT	SHORTFALL	ACTION TAKE TO OVER COME SHORTFALL
			REQUIRED	AVAILABLE						
1	2	3	5	6		7	8	9	10	11
	Thanjavur city municipal corporation	Auto (tractor)	2	2		1.5	3	9		
		Tipper lorry	6	6		1.5	4	36		
		Dumper places	2	2		1	4	4		
		compactor	1	1		7	4	28		
		Refux collector	-	-		-	-	-		
		M.T.L	3	3		1	3	9		

©IJRASET 2015: All Rights are Reserved

Volume 3 Issue X, October 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

IV. SOLID WASTE MANAGEMENT

A. Waste Characterization

Waste characterization is the process by which the composition of different waste streams is analysed. Waste characterization plays an important part in any treatment of waste which may occur. here the wastes are characterized by the method of type of the waste materials like plastics,papers,Inert,Organic bio de gradable and moisture content.

Table 4.1: Waste Characterization

SL. NO	NAME OF THE ULB	DATE OF TEST	ORGANIC/BIODEGRADABLE (%)	GLASS METALS RUBBER HEATHER (%)	INERT %	PAPER %	PLASTIC %	MOISTURE CONTENT%	CHEMICAL CHARACTERISTICS				
									Organic carbon %	Nitrogen%	Phosphours %	pottasium	Calorific valve (k cal/kg)
1	Thanjavur municipality corporation	09.09.2014	63	1.8	6.2	4.8	9.42	-	-	-	-	-	-

B. Compost Yard

Composting is a process of recycling decomposed organic materials into a rich soil.this process has to be done by the open dumping of environment at the place of srinivasapuram.The area of the compost yard was 22 acres. As per norms consider 1 acre for 10000 populations.



Fig 3.3 Refuse Collector in Compost Yard

©IJRASET 2015: All Rights are Reserved

Volume 3 Issue X, October 2015
ISSN: 2321-9653
International Journal for Research in Applied Science & Engineering Technology (IJRASET)

Table 4.2 Compost Yard

E.Compost yard									
S. NO	NAME OF ULB	POPULATION	REQUIRED EXTENT PER NORMS IN ACRES (1AC FOR IOOOO POPULATION)	AVAILABLE EXTENT IN ACRES	NAME OF THE LOCATION & DISTANCE FROM THE CENTRE OF DOWN	SURVEY NO	WHEATHER SUFFICIENT/ INSUFFICIENT/NO LAND PI MENTION	IF IN SUFFICIENT /NO LAND ACTION TAKEN FOR PROCUREMENT OF LAND	LAND ISSUE IF ANY (ATTACH SEPARATE SHEET IF NECESSARY)
1.	Thanjavur city municipal corporation	223619	2200AC	20.23 Ac	Srinivasapuram(2k)	WARD42-4 T.S.NO.30162 BLOCK NO.			NIL

C. Disposal

Disposal is the final process of solid waste management. Disposal is the no alternative option because it is the functional element in the solid waste management system and the ultimate fate of all wastes that are of no further value. As the terminal action for population control of solid waste, the final target of disposal is to isolate solid waste and its environment impact from biosphere, to limit the infection of hazardous components in wastes to be lower than acceptable levels and to guarantee the safety of human's health and environment.

Table 4.3: Disposal of Solid wastes

SWM DATA 2015									
DISPOSAL									
Name of the ULB	Total quantity generation in MT	Open Dumping if yes mention quantity	Windrow system of composting if yes mention quantity	Bio gas	Bio gas power plant if yes mention capacity and energy produced in kwH	RDF if yes mention quantity	Waste to energy facility	Scientific closure if any	Land fill
Thanjavur city municipal corporation	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

©IJRASET 2015: All Rights are Reserved

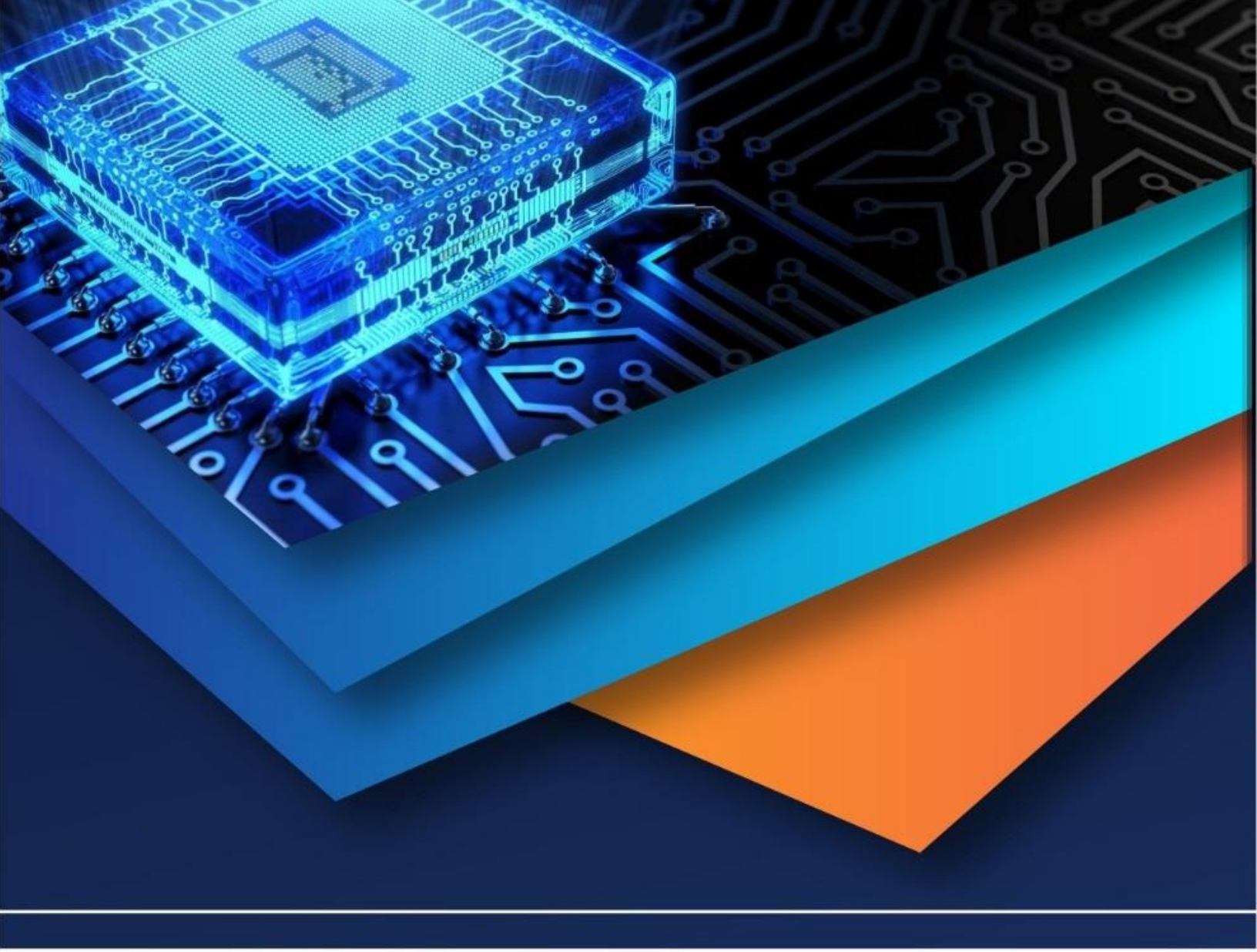
V. RESULTS AND CONCLUSION

This study carries a physical characterization of MSW for Thanjavur district
Solid waste management was studied at the area of Thanjavur district and the population of 223619 at the census of 2011.
Number of households in Thanjvur was 56701
The maximum solid wastes are collected by the vehicle of tipper lorry 36MT and its having a capacity 1.5MT.
10 types of vehicles are used while collecting the solid wastes from the households.
Total quantity of solid wastes are generated at Thanjavur district was 110MT
Compost yard located at Srinivasapuram at 2kM distance from the centre of the town
Wastes are characterized by the types of wastes like plastics, papers and inert etc.

REFERENCES

[1] M. Aatamila, et al., "Odor Annoyance near Waste Treat-ment Centres: A Population-Based Study in Finland," Journal of Air and Waste Management Association, Vol. 60, No. 4, 2010, pp. 412-418.
[2] L. Rushton, "Health Hazards and Waste Management," British Medical Bulletin, Vol. 68, No. 1, 2003, pp. 183- 197.
[3] R. R. Chander and R. Marc, "Urban Infilling Impacts on Solid Waste Facilities," 2006.
[4] Burntley, S.J., 2007. A review of municipal solid waste composition in the United Kingdom. Journal of Waste Management 27 (10), 1274–1285.
[5] Chung, S., Lo, C., 2008. Local waste management constraints and wasteadministrators in China. Journal of Waste Management 28, 272–281.

©IJRASET 2015: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)