

Municipal Solid Waste (MSW) production and management in Kovilpatti Municipality

Authors:

Govindarajan B¹
Senthilkumar P² and
Prabakaran V³.

Institution:

¹Department of Zoology,
Manonmaniam Sundaranar
University, Thirunelveli-
627012, Tamil Nadu, India.

²Entomo Pathology Lab,
Institute of Forest Genetics
and Tree Breeding,
Coimbatore-02, TamilNadu,
India.

³Department of Zoology,
Government Arts College,
Karur-639005, Tamil Nadu,
India.

Corresponding author:

Govindarajan B.

ABSTRACT:

Studies were performed to appreciate the present status to municipal solid waste (MSW) in Kovilpatti town. MSW is a complex waste. It is a classic example where many different types of wastes aggregate from domestic, commercial and industrial sources within a single waste stream. Solid waste problem is universal but recycling and utilization of wastes according to local conditions is an important task. Kovilpatti is an important town for match box industries. The present study is aimed to find out possible ways of utilization of MSW of Kovilpatti town.

Keywords:

Municipal Solid Waste (MSW), Kovilpatti municipality.

Article Citation:

Govindarajan B Senthilkumar P and Prabakaran V.

Municipal Solid Waste (MSW) production and management in Kovilpatti Municipality.
Journal of research in Biology (2011) 5: 307-311.

Web Address:

[http://jresearchbiology.com/
Documents/RA0091.pdf](http://jresearchbiology.com/Documents/RA0091.pdf).

Dates:

Received: 25 Aug 2011 / **Accepted:** 27 Aug 2011 / **Published:** 01 Sep 2011

© Ficus Publishers.

This Open Access article is governed by the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0>), which gives permission for unrestricted use, non-commercial, distribution, and reproduction in all medium, provided the original work is properly cited.

INTRODUCTION

India generates about 210 million tons of Municipal solid wastes (MSW) each day and the quantum of wastes produced increases at a rate of 1.5% per year (Abbasi and Ramasamy, 2001). The urban population in India is increasing explosively with proportionate increase in the solid waste, causing great stress on environment. Improper management of urban solid wastes causes pollution of ground and surface water, land and air covering biosphere problems. These problems are already acute in cities, towns and villages as the disposal facilities are not keep in pace with the quantum of wastes being generated.

Garbage is a heterogeneous bulky material of solid wastes generated from human dwelling and other city habitation, which includes both biodegradable and non-biodegradable components. At all levels of development human beings produce domestic, agricultural, industrial, hospital and wastes at the public places. For designing the solid waste management system of an area first important aspect is to be known how much solid waste is generated at a specific area.

Solid waste problem is universal but recycling and utilization of wastes according to local conditions is a difficult task. Kovilpatti is an important town for match box industries, and vegetable market. It has a population of 87450 (2001 census) in 36 wards with an extent of 6.59 sq.km (www.municipality.tn.gov.in). The solid wastes produced by the city at present are disposed of by dumping the wastes in the dumping yard in Alampatti Village, 3 km away from the town centre, which occupy an area of 3.81 acres. Since improper disposal of municipal wastes cause severe environmental pollution, the present study is aimed to find out possible ways of utilization of MSW of Kovilpatti town.

The sanitary infrastructure of the municipality, sanitary staff, population density, area covered, type of area, total quantity of waste produced, vehicles used for collection, frequency of collection, sources of waste and present disposal method of municipality are the important aspects to be considered for planning effective solid waste management. Hence efforts must be taken for proper scientific management of MSW in cities and towns. The present study was to assess the solid waste handling by Kovilpatti municipality.

MATERIALS AND METHODS

Collection and Physical characterization:

Physical characterization of municipal solid waste components in various sanitary divisions of Kovilpatti was carried out according to the method of Tchobanoglous *et al* (1977). To assess the individual components present with in the mass of the heterogeneous waste mix of the MSW, a truck full of waste was collected from each sanitary division (1-6) and transported to a corner of the dumping yard where the waste was segregated into different components by hand sorting and listed.

RESULTS

The municipality town of Kovilpatti is divided into 36 wards and based on the geographical location of these wards, grouped together to form 6 sanitary divisions. Number of population, streets, garbage bins, garbage collection per day and culverts in Kovilpatti (Table 1), wards covered under each sanitary division and the population density are given in Table 2. Only 124 dust bins have been placed for the total area of 6.59 sq.km of Kovilpatti municipality. Slum area details are given in Table 3. The various kinds of waste composition in Kovilpatti municipality was debited in Table 4. A sullage truck is used to collect the night soil from the public toilets when the tank is full. In addition to these tricycle is used to collect and dump the bio-medical wastes from various hospitals, dispensaries and clinics.

The profile of the current sanitary manpower of Kovilpatti municipality involved in solid waste disposal is given in Table 5. The staffs grouped into different categories, viz., general administrative staff, revenue department, accounts section, engineering division, town planning section, and public health section. In all these sanitary divisions the organic materials such as food waste and the plant residues dominated the other wastes. The percentage presence of glass, iron products, rubber and leather were found to be negligible. At present dumping site was not fully improved to carry out any composting activities. Therefore the municipal authorities are trying to solve the problem.

DISCUSSION

Municipal solid waste management is a complex problem and it demands creative solutions from many disciplines. Studies on solid waste management have been carried out by many workers in various cities and towns: Nanda *et al* (2000 a, b) in Burla Town, Orissa, Goswami *et al*

Table: 1 Municipal solid waste management at Kovilpatti town

Ward No.	Population	No. of Streets	No. of Garbage bins	Garbage collection per day (MT)	Culverts
1.	2629	5	2	0.815	2
2.	1768	5	3	0.522	5
3.	3633	1	2	1.033	6
4.	1684	9	5	0.476	27
5.	3487	7	3	0.9522	9
6.	2633	8	4	0.790	9
7.	2460	5	2	0.678	7
8.	2964	5	3	0.942	19
9.	3321	3	4	1.016	12
10.	2104	4	3	0.662	16
11.	2883	11	5	0.855	22
12.	2940	9	2	0.862	7
13.	3006	6	2	0.917	12
14.	1812	8	5	0.562	10
15.	2190	9	4	0.702	17
16.	1530	8	3	0.514	6
17.	2380	5	4	0.722	7
18.	2272	6	5	0.739	10
19.	2219	4	4	0.678	4
20.	1480	11	4	0.467	5
21.	1845	4	6	0.551	10
22.	1366	5	2	0.473	2
23.	1059	5	4	0.896	5
24.	1845	4	6	0.551	10
25.	2348	6	2	0.854	10
26.	3067	6	5	0.714	5
27.	2880	8	3	1.104	7
28.	3047	7	3	0.923	6
29.	2958	19	2	0.889	7
30.	3158	5	4	0.878	13
31.	2225	5	3	0.741	10
32.	2047	4	4	0.613	8
33.	2751	11	3	0.862	16
34.	2543	5	3	0.760	11
35.	3061	4	4	0.641	3
36.	2106	7	4	0.606	10

(2001) in Gauhati, Assam,; Saxena & Joshi (2002) in Hardwar, Uttranchal,; Daniel & Paul (2004 a); Paul (2005) and Paul & Daniel (2007) in Dindigul, Tamil Nadu, India. The quantity of waste produced in the developing countries like India is lesser than that in the developed countries and is normally observed to vary between 0.2 to 0.5 kg/head/d (CPHERJ 1973; Ahsan 1999; Palnitkar 2000).

The present study has shown that the average per capita waste production of Kovilpatti town is 27m.t/d. It is high because of largest match industry area. Villages around the town regularly visit this area on all days for various commercial

purposes. Munnoli and Bhosale (2002) also reported that the quantity of solid waste generation shoots up because of the floating population in Goa.

Similar type of results was observed by Cailas *et al* (1996) and Beede and Bloom (1995) in their studies on the rate of waste production with reference to the population size. The wards covered under the thickly populated domestic area, i.e., ward no 10 is a slum area and hence the population is dense. The residential household waste dominated the non-residential sector because of the large population, but the non-residential source contained more quantity of organic fractions and

Table: 2 Zone wise (Sanitary Division) Details

Sanitary Division	Wards Covered	No of individual	Waste Generation
1.	1,2,3,4,23,24	12,144	3.64
2.	5,6,7,8,12,13,14	19006	5.81
3.	15,16,17,18,19	11,023	3.30
4.	20,21,22,25,26,27	12,291	3.68
5.	28,29,30,31,32,33	15,134	4.54
6.	9,10,11,34,35,36	21,108	6.33
Total		90,706	27.30

Table: 3 Slum Areas and Population

Name of the Slum	Ward No.	Population	No. of Household
Bharathi Nagar	30	2225	556
Stalin Colony	31	3065	766
Natarajapuram	35	1633	408
Subramaniapuram	36	2107	536
Anna Nagar	29	2958	740
Valluvar Nagar	10	3428	851
Total		13661	3857

that was due to the presence of the match box industries and vegetable wastes and large quantities of leaves in the wastes, i.e., the wastes produced by the markets, hotels and wedding halls. Some of the waste produced by the wedding halls and the hotels are collected and used as dog feed by those who rear them around the Kovilpatti municipality limits.

Open and unregulated dumping is the predominant method of waste disposal in, Kovilpatti. The waste piles are exposed to wind and rain and also to rats, flies, insects, pigs and other animals. In some places the people set fire to the wastes. The rag pickers spend their days sorting through the garbage for reusable and recyclable materials. The trashes were found to be accumulated along the road sides, in vacant places, particularly in the poorer sections of the town.

Placing dust bins may lead to reduction in the problem of waste accumulation along the roadsides, but only 124 dust bins have been placed

Table: 4 Details of Solid Waste Composition

Waste Composition	Quantity (MT)	% Generation
Hoseholds, Petty shops and Establishments	21.00	77.7
Vegetable, Fruit, Flower market	3.00	11.11
Meat, Fish, and Slaughter house	0.5	1.8
Construction	2.5	9.39
Hospital waste	0.200	Negligible
Total	27	100

in the whole Kovilpatti town with a 6.59 sq.km. area. Park (1997) has explained the advantage of house to house collection and it has resulted in a simultaneous reduction in the number of public bins. Plastics are the major compounds that pollute the environment, but comparatively its presence was very less. The same type of observation has been made by Munnoli & Bhosale (2002) in Goa, and Reddy *et al* (2002) in Bangalore.

The composition of the hospital wastes of Kovilpatti town showed only 0.2 mt was found highly infectious. The WHO (2002) also has observed the presence of 20% of hazardous materials and 80% of benign materials in bio-medical wastes. For planning an effective solid waste management by Kovilpatti municipality, a newly modified profile recommended. Recycling is a major play in MSW reduction. Glass, aluminium cans, plastics, newspapers and organic materials can be recycled, the construction waste can be used for landfills and the hospital waste can be incinerated. It is essential to get public support for a sound

Table: 5 Man power involved in Kovilpatti Municipality

S.No	Position	Numbers
1	General Administration	19
2	Revenue Department	12
3	Account Section	1
4	Engineering Division	34
5	Town Planning Section	3
6	Public health Department	26



waste management programme. Creation of awareness among the public on waste management will improve sanitary conditions and the scenic beauty of Kovilpatti.

ACKNOWLEDGEMENT

Authors sincerely thank kovilpatti municipality staffs and heartfelt thanks to Mr K. Naveenkumar, B.E.,

REFERENCES

Abbasi SA and Ramasamy E. 2001. Waste and wealth. In: Solid waste management with earthworms. Discovery Publishing house, New Delhi. P. 1-7.

Ahsan N. 1999. Solid waste management plan for Indian megacities Indian J. Environ. Protection. 19 (2):90-95.

Beede DN and Blom DE. 1995. The economics of municipal solid waste. The World Bank Observer. 10(2):113-150.

Cailas MD, Kerzee RG, Bing-Canar J, Mehash EX, Croke KG and Swager RR 1996. An indicator of solid waste generation potential for Illinois using principal components analysis and geographic information systems of the air and waste management association. 466:414-421.

Daniel T and Paul JAJ. 2004. Solid waste management options for Class-I Towns. In: Proceedings of the National conference on "Environment awareness and pollution impacts", Centre for Energy and Environmental Science and Technology, NIT, Trichy, Tamil Nadu. India. 157-165.

Goswami B, Kalita MC and Talukdar S. 2001 Bioconversion of municipal solid waste through vermicomposting. Asian J. Microbiol. Biotech. Environ. Sci., 3:205-207.

Kawata K. 1963. Environmental sanitation in India. Christian Medical College, Ludhiana, Punjab.

Munnoli P and Bhosale S. 2002. Solid waste disposal in Goa. Proceedings of National seminar on Solid waste management-current status and Strategies for future (Eds) R.K. somashekar and M.A.R. Iyengar, Bangalore, India. 9-13.

Nanda SN, Mishra B and Tiwari TN 2000-a. Municipal solid wastes in Burla Town (Orissa): (1) Preliminary Survey. Indian J. Environ. and Ecoplan., 3(3):643-646.

Nanda SN, Mishra B and Tiwari TN. 2000-b. Municipal solid wastes in Burla town (Orissa): (II) Physico-chemical characteristics. Indian J. Environ. and Ecoplan., 3(3):647-652.

Park K. 1997. Environment and health. In: Preventive and social medicine, 15th Edn. Pub: Banarsidas Bhanot, Jabalpur.468-541.

Palnitkar S. 2000. Municipal solid wastes. In: manual on municipal solid waste. Ed: Palinitkar S Pub: All India Institute of local self-government. pp 9-19.

Paul JA, Karmagam N and Daniel T. 2005. Effect of worm population on biomass of *Eudrilus eugeniae* in municipal solid waste and the status of microorganisms. J. Ecobiol., 17(6):567-570.

Paul JA and Daniel T. 2007. Standardization of sampling method for physical characterization of municipal solid waste. Asian J. Water Environment and Pollution.

Saxena P and Joshi N 2002. Organic Waste Decomposition by using *Mucor* sps. and *Penicillium* sps. in combination. Indian J. Environ. and Ecoplan., 6(3):583-586.

Tchobanoglous G, Hillary Theisen and Roif Eliassen 1977. In: Solid Wastes: Engineering-Principles and Management Issues. McGraw Hill International Students Edition, New York.

WHO 2002. Wastes from health care activities, World Health Organization Information, Fact Sheet No. 253.

www.municipality.tn.gov.in.