Solid Waste Management in Vellore District, Tamil Nadu

A. Royal Edward Williams and S. Kumar

Abstract Rapid growth of population and urbanization has resulted in increasing the volume of solid waste generation in the study area in particular and in India with 68.8 million tons/day. The improper disposal of solid waste becomes a major menace to the urban area and their surroundings. The management of Municipal Solid Waste (MSW) has become an acute problem to the society due to enhancement of economic activities and modernization. The composition of MSW is 51 % organic, 17.5 % recyclables (paper, plastic, metal and glass). The composition of MSW in the North, East, South and Western regions of the country varied between 50 and 57 % of organics, 16–19 % of recyclables, 28–31 % of inserts and 45–51 % of moisture. In Tamil Nadu, the estimated volume of solid waste is around 6404 tons/day and the per capita solid waste generation is 0.71 kg. The development along with population growth resulted in the accumulation of huge amount of solid waste including hazardous and toxic waste. The main purpose of this paper is to give a view of the solid waste management, practices and its implications on environment in Tamil Nadu.

Keywords Solid waste management · Issues · Practices · Environment

1 Introduction

Solid waste management is one of the most challenging issues in India then elsewhere at the global level which are facing a serious pollution problem due to the generation of Municipal Solid Waste (MSW), which has also increased tremendously with improved life style and social status of the populations in urban center.

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M. Prashanthi and R. Sundaram (eds.), *Integrated Waste Management in India*,
Environmental Science and Engineering, DOI 10.1007/978-3-319-27228-3_2

Each urban resident generates 350–1000 g solid wastes per day. Every day urban India generates 188.500 tons of MSW, 68.8 million tons per year solid waste generation and it increases by 50 % every decade. In 2015, the population will rise up to 50 lakhs and by 2025 it is expected to go up to 56 lakhs. The rapid growth of industrialization and population explosion in India has led to the migration of people from village to the cities which generates thousands of tons MSW generation day by day. Municipal solid waste generation (MSW) in urban India increased from 23.86 million tons per year to more than 39 million tons per year. The improper handling of wastes and open dumping affects human health and environment. Tirupattur town generated 12.50 MT of solid waste per day, of this nearly 10.00 MT of the solid waste is collected, transported and disposed daily which works to per capita generation of 250 g/day. The efficient present mechanism can collect 80 % of the total waste generated in the town. Of the total garbage collected, 48 % is the domestic waste, 42 % is the commercial waste and 10 % is the construction wastes among the domestic solid waste (Chandraleka 2014; Karthigarani and Elangovan 2014; Sathewaran 2014).

1.1 Major Issues of Municipal Solid Waste Management

The Ministry of Environment and Forests (MoEF) of the Government of India has issued Management and Handling rules in the year 2000 for scientific municipal solid waste management (MSWM), ensuring proper collection, segregation, transportation, processing and disposal of MSW and to upgrade of the existing facilities to arrest contamination of soil and ground water.

As per provision, CPCB has been assigned to monitor the implementation of these rules and the municipalities will be required to submit annual reports regarding the status of MSW in their areas to the CPCB. These rules are applicable to every municipal authority in India, which is responsible for MSWM.

In addition, there are municipal corporation acts in different states such as the Delhi municipal corporation act 1959, Uttar Pradesh municipal corporation act 1959 and Karnataka municipal corporation act 1976. These acts also deal with environment pollution caused by improper disposal of solid waste.

During the past two decades, India is facing a lot of problems in municipal solid waste management. The fact is that MSWM rules are not being effectively implemented in most of the local bodies accounting to about 4377 municipalities and municipal corporations spread throughout the country. But mega cities or few other cites also maintain the collection and storage of waste in a proper manner. The major focus of the study is to identify the average solid waste disposal at household level and the disposal method practiced in the study area (Gidde et al. 2008).

2 Analysis and Interpretation

The collected sample in the study area was analysed with the help of SPSS software. Only few variables were discussed below and the variables were significant role in the domestic solid waste at the household level. Among the variables, mode of solid waste disposal at the household level is primarily discussed.

3 Mode of Disposal

For this study, the mode of solid waste disposal with frequency and percentage was given in Table 1.

The Table 1 shows that 88.9 % of the people dumped the household waste in open places, commercial waste are dumped onto the road side. Only one respondent used to burn their domestic waste and around 10 % of the household disposed through other methods. The recycling method adopted for this study was given in Table 2.

Many of the responses in the study shows that domestic household waste cannot be reused. Only the commercial waste is reused by the government. But only one respondent said that they are recycling their domestic waste by converting into manure for their garden and the rest said that they simply dumped into the common area/bin. The material composition in domestic waste is given in Table 3.

This shows that various type of material is disposed as domestic waste. Among the samples, almost 67 % of the respondents stated that waste paper occupies the major portion of waste from their households. Next to this level carry bags stands second with 22.2 %, 1.4 % of their waste comes from food waste, fold cloths, old cloths, respectively and only 2.8 % their waste comes from medicine waste. The amount of waste disposal by individual is represented in Table 4.

Table 1 Mode of solid waste disposal

Mode of disposal	Frequency	Percentage
Dumped in open space	64	88.9
Burnt	1	1.4
Any other methods	7	9.7
Total	72	100.0

Table 2 Recycling method adopted

Do you recycle the waste?		
Response	Frequency	Percentage
Yes	1	1.4
No	71	98.6
Total	72	100.0

Table 3 Percentage of material composition in the domestic waste

Types of wastes material		
Items	Frequency	Percentage
Paper	48	66.7
Carry bags	16	22.2
Ball point pens	2	2.8
Buckets	1	1.4
Fold clothes	1	1.4
Old clothes	1	1.4
Waste food	1	1.4
Medicine	2	2.8
Total	72	100.0

Table 4 Average waste disposal (in kg)

Domestic waste (in kg)	Frequency	Percent
1	31	43.1
2	41	56.9
Total	72	100.0

The Table 4 shows the average disposal of household waste. Almost 57 % of the respondents are disposing nearly 2 kg on an average basis and 43 % of the respondents dispose only 1 kg. Table 5 shows that the various agencies involved in collecting the solid waste and garbage waste in the study area.

Among the samples, most of the respondents i.e., 85 % of them said that waste is collected by the municipal worker, next to this people pay a private collector to collect the waste and only four respondents said that NGOs are playing a vital role in collecting the solid waste and these NGOs convert the solid waste into wealth. The frequency of solid waste collection is given in Table 6.

Table 6 infers the regular collection of solid waste by the municipal workers on daily basis. Around 43 % of the respondents stated that the municipal workers are

Table 5 Agency involved in collecting the waste

Mode of collection	Frequency	Percent
Municipality	61	84.7
Private	7	9.7
Others	4	5.6
Total	72	100.0

Table 6 Regular of solid waste collection

Daily collection	Frequency	Percent
Yes	31	43.1
No	41	56.9
Total	72	100.0

Table 7 Willingness to pay for clean atmosphere

Willingness	Frequency	Percent
Yes	45	62.5
No	27	37.5
Total	72	100.0

collecting the waste daily and majority of the respondents i.e. 57 % of the sample respondents stated that workers are not collecting the waste regularly.

4 Respondent's Willingness to Pay

Some of the respondents are willing to pay for the waste disposal, the frequency is given in Table 7.

It is clear that almost 62.5 % of the respondents expressed their willingness to pay for cleaning the garbage waste in their surrounding area and to prevent the location from diseases. Only 37.5 % of the respondents have stated that they are not willing to pay as they are paying the house tax and hence they claim it is the responsibility of the Tirupattur municipality.

5 Impact of Improper Disposal of Solid Waste

Large quantities of solid waste are subjected to uncontrolled, unscientific and incomplete combustion which results in release of a number of toxic gases into the atmosphere which causes air pollution, acid rain etc. Large quantities of chemicals are quickly pushed into drains and rivers causing immense damage to human health. Dumping of agriculture solid waste and municipal solid waste will pollute soil, affect it's fertility and contaminate the ground water. Solid waste produces foul smell, breeds insects and mosquitoes besides deteriorates the aesthetic value of land. Solid waste changes the properties of air, soil and water.

6 Conclusion

Solid waste management is one of the serious problems in Tirupattur in particular and all over India and world in general. In Tirupattur town the accumulation of solid waste generation is about 12.50 MT per day, of these nearly 10.00 MT of the solid waste collected, transported and disposed daily which works to per capita generation of 250 g/day. Only one respondent in the sample is recycling their domestic waste for gardening and the rest of them were simply dumping in the open

space. As the income level of the respondent increases the usage of plastic bags and paper also increase and it ends in the form of waste. Nearly 62 % of the respondents are having the willingness to pay for clean environment.

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http://www.springer.com/978-3-319-27226-9

Integrated Waste Management in India
Status and Future Prospects for Environmental Sustainability
Prashanthi, M.; Sundaram, R. (Eds.)
2016, IX, 277 p. 125 illus., 21 illus. in color., Hardcover
ISBN: 978-3-319-27226-9