

Awareness on Solid Waste Generation at Household Level Aundipatty Taluk, Theni District of Tamil Nadu

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Abstract: *Solid waste can be defined as material that no longer has any value to the person who is responsible for it, and is not intended to be discharged through a pipe. Modernization and progress has had its share of disadvantages and one of the main aspects of concern is the pollution it is causing to the earth- be it land, air, and water. It can cause serious impact on health and problems to the surrounding environment. Creating awareness among the people through education is the way to find solution to the environment problems. Public participation in awareness programs which results in segregation at point source and reduction of waste. This paper attempt to analyse the awareness of the households in solid waste generation and management.*

Key words: *waste, pollution, environment, health, awareness, programme.*

Introduction

The term "solid waste" means any garbage, refuse, or sludge from a waste treatment plant, water supply treatment plant, or air pollution control capability and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations (US Law-Solid Waste Act 2, 1999). Solid waste can be categorization into dissimilar types, depending on their source; household waste is usually confidential as municipal waste; industrial waste as hazardous waste, and biomedical waste or hospital waste as transmittable waste. Majority of the municipal waste materials collected are discarded on open wasteland or low-lying areas even near creeks, forests, rivers, ponds and other ecological sensitive regions in a more or less uncontrolled manner, such inadequate waste discarding creates serious environmental problems that affect health of humans and animals and cause serious economic and other welfare losses. The improper management and lack of public awareness, a major part of the cities is largely polluted and create health sufferings of general people.

The environmental degradation as well as health impact of people caused by inadequate disposal of waste can be expressed by the contamination of surface and ground water through direct waste contacts or leach ate, air pollution by burning of wastes, spreading of diseases by different vectors like birds, insects and rodents, or uncontrolled release of methane by anaerobic decomposition of waste. Raising awareness about municipal solid waste management is an essential component of effective waste management. It is important for key stakeholders to be aware of a city's waste management activities and have a strong understanding of the benefits of proper solid waste management. Although, many challenges arise when raising awareness about solid waste management, a variety of communication techniques can be used.

Statement of the problem

India produces around 42 million tons of solid waste annually. The rate of generation of household solid waste in the developing countries is increasing with an increase of population, technological development, and the changes in the life styles of the people which is posing a great environmental and public health problem. Solid waste management is one of the most essential functions in a country to achieve a sustainable development. The most common ways to treat waste in India today are open dumping and uncontrolled burning. These methods are causing severe environmental pollution and health problems. When waste is incinerated in an incineration plant there are many environmental benefits. First of all, the possibility of using flue gas treatment prevents emissions of toxic compounds to emit to the air compared to if waste is burnt uncontrolled. Secondly, the amount of waste going to the dumpsite will decrease, resulting in a reduction of methane formation and less leakage of sewage from the dumpsite to the groundwater. As family size and income are the most significant factors affecting the quantum of solid waste generation are the present study analyses that quantum solid waste (degradable and non-degradable) at household level in Aundipatty taluk to find out the residential solid waste generation and management.

Review of Literature

A vast number of studies has given attention on waste management problems in rural and urban household sector. These studies cover of various sizes and different ecological, climatic, cultural, religious and socio economic regions. A few studies are summarised below.

Abduli MA, (2008) argued that the solid waste was the result of human activities; and if an appropriate management system was not used for managing the waste, it might lead to environmental pollution and might jeopardize the health of mankind. The activities associated with the management of solid wastes from the generation point to its final disposal had been grouped into six functional elements such as waste generation, storage, collection, transfer and transport, processing and recovery and disposal. The same author had mentioned that there were seven major sources of solid waste generators; residential, industrial, commercial, institutional, construction and demolition, medical, and agricultural wastes. In the study area the solid waste generators were found to be residential, commercial and the medical units. About 646.43 grams solid waste per capita was generated in the residential areas of the 21 villages in the study area.

Ibrahim Bathusha and sasetharan (2006) stated that the urban society and generates and reject solid material regularly. The burgeoning population makes rapid increase in production and consumption. Volumes of wastes generated have increased considerably. Improper management of the solid waste lead to public health hazards, environmental pollution, unanaesthetic appearance etc. most parts of

India are not efficient in handling wastes when compared to developed countries. In India, management of municipal solid waste is the last priority in municipal environment services. Hence declining quality of urban environment is matter of concern and the importance of efficient solid waste management is to be recognized. In Coimbatore the solid waste collection is only 60 percent and does not follow any scientific approach in the collection, transportation, treatment and disposal. Among the various civic problems, the solid waste management has been identified as an important one.

Objectives of the Study

1. To investigate the level of awareness on solid waste generation and management.
2. To analyse the education level and awareness on solid waste generation and management.

Methodology

The study based on primary data which were collected during December 2015 - May 2016, and covered residential densities in rural and urban areas. The primary data has been collected through interview method by using a well structured interview schedule. There are nearly 37,000 households in Aundipatty taluk. Keeping the view of the objectives of the study, it was decided to study 185 (i.e., 0.5%) sample households and they were identified by using simple random sample technique. Statistical package for social science (SPSS) are used for analytical purpose. In order to study the socio economic status, solid waste generation at household level in Aundipatty taluk, simple percentage analysis and Chi – square test was used.

Results and Discussion

The quantum of total solid waste generated at the household level, awareness about solid waste generation, awareness about solid waste management, awareness on impact of solid waste and level of solid waste awareness in the study area are discussed systematically below.

Table 1: Quantum of Total Solid Waste Generated Households

Sl. No	Quantum of solid waste	No of respondents	Percentage
1.	Less than 10 kg	92	49.7
2.	10 to 15 kg	79	42.7
3.	More than 15 kg	14	7.6
	Total	185	100

Source: Primary data

It is inferred from the table 3 that out of 185 respondents, 49.7 percent of the respondents have generate less than 10 kg of household waste per week, 42.7 percent of the respondents have generate 10 to 15 kg of household waste per week and remaining 7.6 percent of the respondents have generate more than 15 kg of household waste per week in the study area.

Table 2: Awareness about solid waste generation

Sl. No	Particulars	Known	Somewhat Known	Don't Know	Total
1.	Know what is solid waste	159(85.9)	18(9.7)	8(4.3)	185(100.0)
2.	Quantum of solid waste	22(11.9)	76(41.1)	87(47.0)	185(100.0)
3.	Types of solid waste	83(44.9)	67(36.2)	35(18.9)	185(100.0)
4.	Nature of solid waste	80(43.2)	77(41.6)	28(15.1)	185(100.0)
5.	Source of solid waste	81(43.8)	75(40.5)	29(15.7)	185(100.0)
6.	The waste hierarchy	10(5.4)	68(36.8)	107(57.8)	185(100.0)

Source: Primary data

It is inferred from the table 2 that out of total respondents, 85.9 percent make out known awareness about the solid waste generation in know what is solid waste, 47.0 percent don't known awareness about the solid waste generation in quantum of solid waste, 44.9 percent known awareness about the solid waste generation in types of solid waste, 43.2 percent known awareness about the solid waste generation in nature of solid waste, 43.8 percent known awareness about the solid waste generation in source of solid waste and 57.8 percent don't known awareness about solid waste generation in the waste hierarchy.

Table 3: Awareness about solid waste management

Sl. No	Particulars	Known	Somewhat Known	Don't know	Total
1.	Disposal of solid waste	140(75.7)	40(21.6)	5(2.7)	185(100.0)
2.	Recycling	106(57.3)	53(28.6)	26(14.1)	185(100.0)
3.	Keeping separate place for solid waste	146(78.9)	34(18.4)	5(2.7)	185(100.0)
4.	Save arson of waste	44(23.8)	60(32.4)	81(43.8)	185(100.0)
5.	A separate dust bin	126(68.1)	55(29.7)	4(2.2)	185(100.0)
6.	Segregation of waste	47(25.4)	53(28.6)	85(45.9)	185(100.0)

Source: Primary data

It is inferred from the above table that out of total respondents, 75.7 percent have awareness about the solid waste management and disposable of solid waste, 57.3 percent have awareness about the solid waste management in recycling, 78.9 percent have awareness about the solid waste management keeping separate place for solid waste, 43.8 percent not have awareness about solid waste management has save arson of waste, 68.1 percent have awareness about the solid waste management a separate dust bin and 45.9 percent not have awareness about solid waste management segregation of waste.

Table 4: Awareness about impact of solid waste

Sl. No	Particulars	Known	Somewhat known	Don't Know	Total
1.	Environment pollution	170(91.9)	15(8.1)	-	185(100.0)
2.	Effect on quality of the soil	110(59.5)	66(35.7)	9(4.8)	185(100.0)
3.	Agriculture impact	131(70.8)	50(27.0)	4(2.2)	185(100.0)
4.	Effect on ground water	113(61.1)	60(32.4)	12(6.5)	185(100.0)
5.	Effect on animals and micro organism	82(44.3)	75(40.5)	28(15.1)	185(100.0)
6.	Diseases	121(65.4)	44(23.8)	20(10.8)	185(100.0)

Source: Primary data

It is observed from the table that out of total respondents, 91.9 percent have awareness about impact of solid waste in environmental pollution, 59.5 percent have awareness about impact of solid waste effect on quality of the soil, 70.8 percent have awareness about impact of solid waste in agriculture impact, 61.1 percent have awareness about impact of solid waste in effect on ground water, 44.3 percent have awareness about impact of solid waste in effect animals and micro organism and 65.4 percent have awareness about impact of solid waste in diseases.

Table 5: Level of Solid Waste Awareness

Sl. No	Particulars	Ranks			Total
		Poor (below 40%)	Low (40 – 60%)	High (Above 61 %)	
1.	Solid waste generation	105 (56.8)	63 (34.0)	17 (9.2)	185(100.0)
2.	Solid waste management	65 (35.1)	86 (46.5)	34 (18.4)	185(100.0)
3.	Impact of solid waste	31 (16.8)	72 (38.9)	82 (44.3)	185(100.0)

Source: Primary Data

From the above table, it is inferred that 56.8 percent majority of the respondents are poor level of solid waste generation, 34.0 percent of the respondents are low level of solid waste generation and 9.2 percent of the respondents are high level of solid waste generation.

It is inferred that out of total respondents 35.1 percent of the respondents are poor level of solid waste management, 46.5 percent majority of the respondents are low level of solid waste management and 18.4 percent of the respondents are high level of solid waste management.

It is noted that out of total respondents, 16.8 percent of the respondents are poor level impact of solid waste, 38.9 percent of the respondents are low level impact of solid waste and 44.3 percent majority of the respondents are high level impact of solid waste.

Hypotheses Testing

Hypothesis (H₀): There is no association between education level and awareness on solid waste generation and management.

In order to study the influence of education level and level of solid waste awareness on solid waste generation and management at households in the study area chi-square test was used

The formula used was

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where

O – refers to the observed frequencies

E – refers to the expected frequencies

Determine the value of χ^2 the steps required are:

$$E = \frac{RT \times CT}{N}$$

E – Expected Frequency

RT – The row total for the row containing the cell

CT – The column total for the column containing the cell

N – The total number of observation

Estimate result

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.409 ^a	4	.000
Likelihood Ratio	27.083	4	.000
Linear-by-Linear Association	19.146	1	.000
N of Valid Cases	185		

It is evident from the estimated result that the significant value of Chi – square test is 23.409 for the 4 degrees of freedom. The calculator value of χ^2 is greater than the table value. Therefore null hypothesis is rejected. Hence it is concluded that there is no association between Gender and awareness on solid waste generation and management.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.961 ^a	8	.005
Likelihood Ratio	26.748	8	.001
Linear-by-Linear Association	13.737	1	.000
N of Valid Cases	185		

a. 6 cells (40.0%) have expected count less than 5. The minimum expected count is .84.

It is evident from the estimated result that the significant value of Chi – square test is 21.961 for the degrees of freedom 8. The calculator value of χ^2 is greater than the table value. Therefore null hypothesis is rejected. Hence it is concluded that there is no association between education level and awareness on solid waste generation and management.

Conclusion

Solid waste management is an integral part of the urban environment, and planning of the urban infrastructure to ensure a safe and healthy human environment, while considering the promotion of sustainable economic growth. Presently the municipal waste management system of the municipality is extremely poor, the waste management and handling is done by the municipal sanitation staff who handle the entire waste collection and transportation which is inefficient and inadequate and improper. Due to lack of awareness and improper positioning and maintenance of dustbins, segregation of waste is not efficient. Creating awareness among the Students' through education is the way to find solution to the environment problems. Public participation in awareness programs which results in segregation at point source and reduction of waste. Solid waste management system in Auntipatty taluk is inadequate.

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