A STUDY ON DOMESTIC HOUSEHOLD SOLID WASTE IN THE SELECTED DISTRICT

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Abstract

No matter the efforts of numerous firms, professionals say, the issues associated with collection, transporataion and disposal of stable waste remains unresolved in metropolitan areas, in which speedy growing populations generate increasing quantities of waste that urban local bodies are unable to successfully control. Municipal solid waste management has failed because of the fact that the position of private zone active participation were nearly low, now a friutful involvement is being taken care in dealing with the waste coping with strategies are critical. The existing study took element and observed out diverse cuases of stable waste and fitness influences due to stable waste in the selected take a look at location and the look at concentartes in locating the connection among strong waste and socio - economic characteristics. Primary data was used in this current study with appropriate statistical tools. socio- economic characteristics of the respondents is correlated with the solid waste management in the present study. At the end of the study, with proper and continuous support should be arranged by the government side is more vital to solve the solid waste issues.

Index Terms - solid waste, over population, urbanisation, people participation, role of government

1. Introduction

Waste generation has increased massively around the world in recent decades and there where like no positive signs of its slow down. In addition to this by the 2050, municipal solid waste generation at worldwide is expected to have an increase, that is roughly about 70 per cent to 3.4 billion metric tons. This is due to a variety of factors, including population growth, urbanization, economic growth, and consumer shopping behavior. Humans generate millions of tonnes of waste each year, which is becoming a major problem around the world. With this enormous amount of waste generated, it is becoming increasingly important for authorities to provide adequate waste disposal and disposal services. However, less than 20 per cent of the waste is recycled each year, and large amounts of waste are still landfilled. Waste is also often disposed of in dangerous landfills, especially in developing countries. Rich countries produce more waste than poor countries, but there are usually better waste management practices to address these concerns. Urban solid waste management in India has become or continues to be a serious problem due to its large daily outbreaks, as well as environmental and aesthetic concerns. Only 31% of India's population lives in urban areas, but 377 million live there (Census of

India, 2011). According to the Central Environmental Protection Agency, 1,43,449 metric tons of urban solid waste are generated daily, and these numbers are increasing daily as the booming population. To exacerbate the problem, the total number of cities in the country (statutory and census) is also increasing. Waste management is one of the biggest problems facing different cities around the world. In particular, the problems are due to urbanization, industrialization, inadequate urban planning, and lack of sufficient resources to contribute to the generation of huge amounts of waste. This disadvantage has brought serious ecological, social and economic problems to developing countries such as Asia. Household, industrial and other waste, whether low or medium level radioactive waste. They cause pollution and are a continuing problem for the world. Population growth and dynamic economic activity in and around the city have created a serious waste management crisis. Lack of financial resources and infrastructure to dispose of solid waste leads to a vicious circle. Lack of resources leads to poor quality of service delivery, resulting in fewer willingness to pay for those services, which further erodes the resource base.

This problem is further complicated by rapid population growth and urbanization, which significantly increases the amount of waste generated in urban areas and the demand for waste management services. However, in most cases, population growth is not closely related to the corresponding increase in municipal income for waste disposal. However, rapid urbanization means the rapid growth of shantytowns, most of which are unplanned and contribute to waste, health and hygiene issues.

City waste can be classified into garbage, garbage / garbage, ash, and troublesome garbage. Garbage includes waste from cooking, cooking and serving of food, and market waste from the handling, storage and sale of food. Solid waste generation can be a steadily increasing disadvantage at the global, regional and national levels. Solid waste is organic and inorganic waste that is generated by various social activities and has lost its price to the main consumers. Improper disposal of solid waste, nationally and globally, pollutes all very important parts of the living environment (ie air, land, water). Urban societies reject solids and often produce them thanks to the rapid increase in production and consumption. Garbage and trash are paper, cardboard boxes, boxes, barrels, trees, tree branches, garden trash, metal, tin cans, glass, dishes and minerals. Ash contains residues from the incineration of fuel and solid waste, and bulky waste includes wooden furniture, bedding, packaging, metal furniture and rubber tires. Residential and commercial waste and industrial solid waste and recyclable production are produced in all homes, apartment buildings and commercial zones, industrial lands, as well as streets, parks and so on. Collecting logistics become more complex as the total amount of waste increases.

State	Collected	Treated	Land filled	No of compost	Quantity generated
Arunachal Pradesh	215.0	-	-	2.0	271.0
Andhra Pradesh	6140.0	548.0	203.0	49.0	6,4440.0
Assam	1,119.4	-	-	2.0	1,293.7
Jammu and Kashmir	1452.9	-	-	1.0	1530.5
Jharkhand	2,043.4	836.7	-	-	2205.0
Odisha	2255.3	91.6	2,163.7	1.0	2564.4
Bihar	-	-	-	11.0	2272.0
Puducheery	505.0	24.0	481.0	2.0	599.3
Mizoram	213.1	29.2	-	-	251.4
West Bengal	13,064.6	916.0	334.0	13.0	14,613.3
Haryana	4430.3	815.9	3614.3	14.0	4635.8
Chhattisgarh	1386.0	1271.0	115.0	489.0	1650.0
Telangana	8360.0	5747.0	869.0	63.0	8497.0
Sikkim	67.1	13.1	51.4	2.0	75.1
Goa	235.9	154.7	1.5	14.0	236.4
Meghalaya	170.6	8.7	161.9	1.0	170.6
Tripura	389.5	150.1	239.4	1.0	445.7
Delhi	10,614.0	5714.0	5225.0	4.0	10,817.0
TamilNadu	12,850.0	7196.0	5654.0	508.0	13,968.0
Uttar Pradesh	17329.4	4615.0	-	2.0	17,377.3
Maharashtra	23,675.7	12,623.3	11,052.4	307.0	23,844.6
Rajasthan	6475.4	780.2	4187.2	1.0	6,625.6

Source: Central Pollution Control Board, (2019).

Table 1: Selected state wise municipal solid waste generation in India

The amount of waste collected, treated, and generated varies from location to location and even from state to state. People in certain locations often have similar backgrounds in terms of income and expenses. Due to the rapid population growth and urbanization of the world, the waste generation rate is endlessly accumulated. In the table above, Maharashtra records a large amount of solid waste generation, about 23,844.6, followed by Uttar Pradesh and West Bengal.

2. Statement of the problem

Urban areas in India generate 62 million tonnes of waste (MSW) annually, which is projected to reach 165 million tonnes by 2030. Approximately 43 million tonnes of municipal waste are collected annually, of which 31 million tonnes are sent to landfills and only 11.9 million tonnes are processed. There are not enough public trash cans, the available trash cans are not covered, and in many cases trash can overflow from these trash cans and out into the streets. India's informal recycling department, made up of waste collectors, plays an important role in waste separation and recycling, but in most cases it is not formally trained and incinerates waste in landfills. Sometimes. India will have to spend a lot of money to build an effective waste management infrastructure (recycling, 2020).

Municipal solid waste workers are facing difficulties due to unmeasurable levels and inadequate municipal solid waste treatment techniques. Urbanization is now a source of increased solid waste generation. Tamil Nadu has a total population of 72,147,030, including 36,137,975 men and women and the 2011 census 36,009,055, accounting for almost 48.40% of the urban population of Tamil Nadu. Current SWM services are unproductive, costly, and so small that they pose a potential risk to public health and environmental quality.

Improper waste management weakens public health, causes environmental pollution, accelerates the depletion of natural resources, causes climate change and has a serious impact on the quality of life of citizens.

The generation of solid waste is predictable and unavoidable. Urban solid waste from the city center that mixes with groundwater courses creates potential human health risks. Side damping and burning of solid waste on the highway has several environmental and socio-economic impacts. Open damping has had a significant impact on water bodies, plants and soils close to human health. Animals and microbes were also affected. Continued disposal of waste in the countryside can cause serious problems of land degradation. Garbage on the street, flooding of trash cans, and slow pickups are becoming commonplace. Citizens have recently faced problems, according to sources at Coimbatore Corporation. While the old and persistent problem of waste producers not providing individual waste remained, logistics problems had a direct impact on roads. (Hindu, 2021).

3. Background of the study

Mary Abed Al Ahad, Ali Chalak, and Souha Fares (2020) found that rapid urbanization of Lebanon, closure of landfills, and lack of infrastructure funding led to improper management of urban solid waste (MSWM). It points out that it has been increasing in recent years. Ongoing garbage crisis. In Beirut and Lebanon, MSWM was implemented at a centralized waste treatment and disposal facility operated by the government. Due to the garbage crisis and the failure of the centralized system, some local governments have begun to decentralize MSWM by installing local facilities that are paid by the local taxes charged to beneficiary households. Geetika Mishra and Mitali Yadav (2019) found that in developing countries such as India, the proportion of municipal waste is increasing due to the rapid movement of people from rural to the area of urban. Urban slums and squatters are also unsanitary. Waste collection methods vary from city to city. Visit sales are not common. Some housing associations hire private staff to collect solid waste from door to door. The city's local government does not have the proper provisions for collecting waste from narrow streets and high-traffic areas. Great care should be taken when disposing of sewage, waste and defecation from such areas. Waste management has been a major problem in cities for decades, and the situation continues to worsen over time due to continued development and population growth. Sustainable waste management is needed to make the city worth living.

Community mobilization is needed to sensitize them to their contributions to waste management and to promote improvements in urban solid waste management infrastructure, sanitary and monitored landfills, and even waste recycling techniques. Raise people's awareness of the importance of source isolation in power plants as a biodegradable, inert, recyclable material, and waste storage and separation according to local council guidance for effective waste management. , Change the habit of disposal. Jesus Das, R.N. Kavya, M. Jananai, and M. Muthu Mithra (2019) have observed that waste management in large cities has become a difficult task as urbanization progresses rapidly. The study aimed to develop an integrated and sustainable waste management model by investigating waste management practices in the city of Coimbatore, an industrial area in Tamil Nadu, India. The methodology used was to collect data from municipalities on waste generation and its treatment techniques, and after analyzing the barriers, a new model called the "distributed model" was

proposed along with its benefits. , Environment and economy. The model was designed and calculated with all parameters taken into account according to the population of each neighborhood. Improper disposal guidelines have caused serious health hazards to fellow humans. Soil, water and air can also be a greater burden if you neglect to handle hazardous waste. Therefore, it is time to address the problems and gaps in municipal waste management policies by conducting surveys. Rahul Bhargava, Pankaj Kumar (2019) pointed out that physical activity in humans and animals produces solid waste, which is usually heavy and unwanted. Today's solid waste contains many substances, such as plastic, which are difficult to decompose and dangerous. These substances are essentially different types of waste from the industry. There is an urgent need to teach and warn the general public to change the habit of storing waste at its source, regulate losses according to community committee instructions, and properly participate in community committee exercises. Non-biodegradable and recyclable waste should be isolated at the source or auxiliary collection point, and biodegradable waste should use strategies such as assembly. Government regulations, policies or controls are needed to oversee waste disposal.

4. Matters and materials

In recent years after economic reforms, the threat of solid waste disposal has become a very serious problem. This is the most important and important part of waste management and disposal. Waste management (SWM) has emerged as one of the major development challenges in urban areas of India. Many studies have shown that unsafe waste treatment produces dangerous gases and leachates due to microbial degradation, climatic conditions, waste properties, and landfill operations. Informal sector of a country is playing a vital role in waste management. However, workers in the informal sector are not officially recognized and lack legal status and protection. They collect over 10,000 tonnes of recyclable waste daily, without the use of protective equipment such as gloves and masks, and often even the basic necessities of uniforms and shoes. But on the other hand, safety equipment is still needed for their empowerment and well-being. In addition, current waste management regulations do not provide incentives for waste collectors and do not recognize the economic value of informal waste recycling operations. Waste management (SWM) has emerged as one of the major development challenges in urban areas of India. Many studies have shown that unsafe waste treatment produces dangerous gases and leachates due to microbial degradation, climatic conditions, waste properties, and landfill operations. There are disadvantages to modernization and progress, and one of the main aspects of concern is the pollution they bring to the planet (land, air, water). As the world's population grows and the demand for essentials such as food grows, the amount of waste generated on a daily basis in each household is increasing. This waste is eventually dumped at the municipal collection center, where it is collected by the municipality and then dumped into a landfill. Coimbatore is the second largest city in Tamil Nadu and the 16th largest agglomeration of cities. It is one of India's fastest growing Tier II cities and is the textile, industrial, commercial, educational, information technology, healthcare and manufacturing center of Tamil Nadu. Current research is based on the collection of primary data, and a multi-level random sampling design was chosen for sample selection. The investigation was limited to Coimbatore. Under Coimbatore Corporation, there are five zones, South Zone, North Zone, Central Zone, East Zone, and West Zone, each with 20 districts, with a random sample size of

661 from the total of the 100 districts surveyed. Was selected for. The specific purpose of this study was to analyze the relationship between solid waste and socio-economic characteristics, as well as the health effects of Coimbatore Corporation respondents and the factors that cause solid waste. Appropriate statistical tools such as correlation and factor analysis were used in the study.

5. Major findings of the study

Socio-economic characteristics such as age, gender, marital status, education, occupation, community, property, and type of house helped in the study to find the relationship between socio-economic conditions and waste management.

S.No		Variables	Frequency	Percentage
1	Age	20 years – 29 years	231	34.63
		30 years – 39 years	264	39.58
		40 years – 49 years	87	13.04
		50 & above	79	11.84
2	Gender	Male	292	44.2
		Female	369	55.8
3	Marital Status	Single	445	67.3
		Others	216	32.7
4	Education	Illiterate	230	34.8
		High School	274	41.5
		Graduate	157	23.8
5	Occupation	Government	128	19.4
		Self – Employed	128	19.4
		Private	201	30.4
		House Wife	204	30.9
6	Religion	Hindu	274	41.5
		Muslim	273	41.3
		Christian	114	17.2
7	Community	FC	86	13.0
		MBC	158	23.9
		BC	245	37.1
		SC/ST	172	26.0
8	Ownership of House	Own House	202	30.6
		Leased House	258	39.0
		Rented House	201	30.4
9	Type of House	Pucca	157	23.8
		Terraced	432	65.4
		Apartment / Flat	72	10.9

Source: Field Survey (2019)

Table 2 :Socio-Demographic Profile of the Respondents

The age distribution of respondents was determined using four categories: 20-29 years, 30-39 years, 40-49 years, and 50 years and older. Of the respondents selected, 40% were between the ages of 30 and 39, followed by 35% between the ages of 20 and 29, 13% between the ages of 40 and 49, and 12% over the age of 50. was. By gender, 55.8% were female and 44.2% were male. Respondents' marriage status showed that 67.3% were single and 32.7% belonged to other categories such as married, divorced, and widow. According to the education classification of the respondents, 41.5% received higher education, 34.8% were illiterate, and 23.8% were scholars. In the job classification of respondents, the majority of the respondents selected were women, so 30.9% were housewives, followed by the private sector at 304%, and civil servants or self-employed at 19.4%.Religious distribution shows that 41.5% were Hindus, 41.3% were Muslims, and 17.2% were Christians. According to the respondents' community data, 37.1% belonged to the BC community, followed

by 26% to the SC / ST community, 23.9% to the MBC and 13% to the FC. Investigators used correlations to determine if there was a link between solid waste management and the social and economic characteristics of the sampled respondents. The results can be seen in Table 3 below.

		Correlations				
		Solid Waste	Income	Marital Status	Family Type	Education
Solid Waste	Pearson Correlation	1	.109**	.119*	.147**	.082**
	Sig. (2tailed)		.005	.002	.000	.036
Income	Pearson Correlation	.109**	1	-.155*	.067	.256*
	Sig. (2tailed)	.005		.000	.087	.000
Marital Status	Pearson Correlation	.119*	-.155*	1	.333*	.098**
	Sig. (2tailed)	.002	.000		.000	.035
Family Type	Pearson Correlation	.147**	.067	.333*	1	.195*
	Sig. (2tailed)	.000	.087	.000		.000
Education	Pearson Correlation	.082**	.256*	.098**	.195*	1
	Sig. (2tailed)	.036	.000	.035	.000	

Source: Field Survey, (2019).
* Significant at 1 % level, ** Significant at 5 % level

Table 3: Relationship between socio- economic characteristics and solid waste management in the selected study area

The variables selected for correlation are offspring, income, marriage status, family type, and education. Fixed drops correlate with marriage status at the 1% significance level, while other variables such as income, family type, and education are statistically significant at the 5% significance level. Income correlates with marriage status and education at a significance level of 1%, while other variables such as decline correlate at a significance level of 5%. Marital status correlates with offspring, income, and family type at a significance level of 1%, and education is statistically significant at a significance level of 5%. Family type correlates with marriage status and education at a 1% significance level, decline is statistically significant at a 5% significance level and education income, and family type is statistically statistically significant at a 1% significance level. Significant and the variables are descent and marriage. The status is statistically significant at the 5% significance level. From the correlation results, it can be determined that the selected variables are correlated with each other at the 1% or 5% significance level, and that the social and economic characteristics of the respondents are correlated with waste management is showing.

6. Health Impacts Faced by the Respondents

In the present study, the respondents were asked to rate their health impacts and their preferences were made rank and converted into percent position by using the formula:

$$\text{Percent position} = 100\,(R_j - 0.5)\,/\,N$$

Where R_j is the rank of the ith item and N refers to the number of items ranked. The percent position was converted into score by using Garrets' Rating scale and the average score obtained for differential reasons are tabulated and presented in table 4.

S.No	Items	Score	Rank
1	Malaria	41.63	4
2	Dengue	72.33	1
3	Chikungunya	65.98	2
4	Skin Allergy	49.99	3
5	Respiratory Problems	37.80	5
6	Wheezing	30.13	6

Source: Field Survey ,(2019).

Table 4 :Relationship between health impacts and solid waste in the selected study area

Respondents' health effects were identified as malaria, dengue fever, chikungunya fever, skin allergies, respiratory problems, and wheezing. Based on the score rankings, we can see that respondents ranked the "Dengue" problem as Rank I because dengue is one of the most prevalent adverse illnesses. Without a target audience as it is caused by mosquitoes. Rank 2 was given to Chikungunya fever. Again, harmful illnesses threaten many people, regardless of age or place of residence. Rank 3 was given for problematic skin allergies. Among the selected respondents, they face skin allergies such as rashes and discoloration of the skin. Rank 4 was assigned to malaria problems, rank 5 was assigned to breathing problems, and rank 6 was assigned to wheezing problems. The   ranking shows that the selected respondents have health problems such as dengue fever, chikungunya fever, and skin allergies.

7. Factors Causing Solid Waste

In the current study, factor analysis was used to find out which dimension is among the various indicators of factors that affect respondents due to solid waste in the environment. Frequency of choosing a maximum score of 4 if the occurrence is common and zero if the occurrence is absent. Cronbach's alpha was calculated to check the consistency of various indicators and was estimated to be 0.886. This is greater than 0.7, indicating the reliability of the indicator. To determine the suitability of using factor analysis, KMO and Bartlett's test measurements were calculated and the results are shown in Table 5.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.748
Bartlett's Test of Sphericity	Approx. Chi-square 578.884
Df	45
Sig.	.000

Source: Field Survey (2019).

Table 5: Kaiser-Meyer-Olkin Measure of Sampling Adequacy

The KMO statistic is 0.748, indicating that it exceeds the validity of the acceptable sample. A value close to 1 indicates that the correlation pattern is relatively compact. The Bartlett sphericity test was also found to be significant at the 1% level, providing evidence that there is a relationship between the variables for applying factor analysis. Table (6) below shows the eigenvalues of the 10 components identified in the dataset, their relative explanatory power, and the factor load.

S.no	Inhibitors	Components	
		1	2
1	Consumerism	.857	
2	Change in life style	.832	
3	Buyer behaviours	.864	
4	Technological development		.972
5	Increase in households		.959
6	Improper disposal methods	.826	
7	Unawareness about the impact of solid waste	.946	
8	Lack of reusing/ recycling habits		.924
9	Improper governance	.770	
10	Lack of public co-operation in reducing waste disposal	.867	
	Eigen values	5.390	2.779
	Percentage of variance	53.899	27.793
	Cumulative percentage	53.899	81.691

Source: Field Survey ,(2019).

Table 6 :Factor loadings for causes of solid waste in selected sample respondents

The analysis was considered to include eigen values greater than alone. The above results show that the eigenvalues of only the first three factors are greater than 1, indicating that only these factors are appropriate for inclusion in the analysis. Together, these factors accounted for 53% of the variance. For sample respondents, Factor 1 puts a heavy burden on seven aspects: consumption, lifestyle changes, buyer behavior, improper disposal methods, ignoring the impact of solid waste, and improper corporate governance. I am. And "lack of public cooperation in reducing waste disposal". Factor 2 places a heavy burden on three aspects: "technological development," "household growth," and "lack of reuse / recycling habits." Therefore, from this study, Factor 1 is a variable such as "consumption behavior", "lifestyle change", "shopper behavior", "inappropriate disposal method", "ignoring the effects of solid waste". It can conclude that the result shows that putting a heavy load on "Inappropriate governance" and "lack of public cooperation in reducing waste disposal".

8. Suggestions

1. Segregation of waste and proper disposal, collection and transportation are key indicators to reduce the majority of waste problems.

2. Awareness is still missing among the people, so continuous support and proper awareness programmes should be arranged by the government side is more vital.

3. Sufficient manpower and technical power also require

4. User pay chargers can be seriously imposed and it is a necessary one to control the solid waste creation

5. Proper disposal methods should be incorporated to reduce the health impacts due to solid waste.

9. Conclusion

Solid waste management requires the attention of governments, public institutions, voluntary organizations, businesses, religious groups, men, women, scholars, and rich, poor and many other tangible and intangible groups. The current study has taken the initiative to analyze solid waste in the Coimbatore region, with the support of both secondary and primary data sources and other published facts and information. The study took the initiative to gather information about different groups of people in society based on income level, with the majority being familiar with solid waste and 56.4% of low-income earners disposing of household solids. According to data collection, 64.9% of middle-income households dispose of 1-2 kg of waste, which is about 82.1 kg. % Is from the high-income group. In addition, street trash, full trash cans, and slow collections are becoming more common here. Also, when the waste was dumped outdoors, the waste flowed into the drain and obstructed the flow of sewage. Without public, private and government coordination in the regulation and disposal of solid waste, the problem may not be permanently resolved. You can use the correlation results to see that the selected variables are correlated with each other at a 1% or 5% significance level. This shows that the social and economic characteristics of the respondents correlate with waste management. From the rankings, you can see that you are facing health problems such as dengue fever, chikungunya fever and skin allergies. The public awareness is still lacking, so continued support from the country should become more important.

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