

The Effectiveness of Dustbin Free System of Solid Waste Management in Tirupattur Municipality of Tirupattur District- A Swachh Bharat Outlook

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ABSTRACT

The Expanding population and urbanization in Tirupattur municipality have resulted in increased solid waste creation, providing substantial problems to long-term environmental management. The purpose of this research is to examine the environmental effect of Tirupattur existing solid waste management techniques, with an emphasis on trash creation, collection, and disposal, as well as their consequence Tirupattur municipality Waste generation for the local ecosystem. The study examines the quantity and type of solid waste created in Tirupattur, taking into account both household and commercial sources. Waste collection techniques, transportation networks, and disposal procedures are all analysed to determine their effectiveness and environmental impact. The study also investigates the occurrence of unlawful dumping sites and their effects on soil and water quality. Preliminary data indicate that poor waste disposal practices lead to soil and water contamination in and around Tirupattur municipality. The study stresses the need for greater waste segregation at the source, better collection infrastructure, and sustainable disposal techniques. Furthermore, community knowledge and engagement are critical components in attaining successful solid waste management while reducing environmental impact. This summary explains the ongoing investigation and underlines the need of implementing Environmental friendly solid waste management procedures in Tirupattur municipality. The comprehensive study will provide specific insights and suggestions to policymakers, local governments, and community stakeholders in the pursuit of a more sustainable and environmentally responsible waste management system.

Keywords: Solid Waste Management; Environmental Impact; Waste Generation; Waste Disposal; Waste Collection.

INTRODUCTION

Solid waste management mainly involves in the complete process of collecting, treating and disposing of solid wastes. Every year, an estimated 11.2 billion tons of solid waste is collected worldwide. India produces 62 million tons of waste annually, with 70% collected, and only 12 million tones treated, while 31 million tones end up in landfills. In Tamil Nadu the total quantity of solid waste generation is 14585.49 Tons/day. Tirupattur town generates 12.50 MT of solid waste per day out of this nearly 10.00 MT of the solid waste being collected, transported and disposed daily, which workers to per capita generations of 250gms/day. This research aims to dive into the complexities of solid waste management in Tirupattur, with a particular emphasis on the environmental consequences. We want to perform a comprehensive review of the waste management lifecycle, from generation to disposal. Our major goal is to identify crucial parts of this process where interventions and changes may be applied, reducing the detrimental impact on the local ecology. It is critical to understand and address the environmental issues raised by Tirupattur existing solid waste management procedures. Our study has the potential to shed light on these concerns, providing useful insights that can guide municipal policy decisions. Furthermore, the findings may be used as a reference for urban planning projects, making it easier to establish and implement more sustainable and ecologically friendly waste management plans.

Crucially, this project seeks to increase community involvement in the development of sustainable waste management strategies. By sharing our study findings and suggestions with the public, we hope to create awareness and inspire active engagement in efforts that contribute to a cleaner, healthier local environment. The importance of this research extends beyond academia, into the practical realms of municipal government, urban planning, and community engagement, eventually leading to the establishment of a more sustainable and resilient Tirupattur municipality.

Significance of the Study

The environmental effect of solid waste management in Tirupattur Municipality is diverse and vital for solving regional concerns. By assessing present methods, the study adds to a better understanding of the environmental degradation caused by poor waste management, opening the way for the creation of sustainable waste disposal techniques that reduce pollution while preserving the local ecology. Furthermore, the study's findings can help detect and prevent any health concerns linked with incorrect garbage disposal, assuring the well-being of people. The emphasis on resource conservation, recycling efforts, and community participation supports ethical waste management practices while also encouraging people and companies to actively participate in trash reduction programs. Policymakers may use the findings to establish and execute effective waste management policies, which will guide infrastructure construction and regulation. Measures and incentives for proper garbage disposal. Furthermore, the report acknowledges the economic benefits of well-managed waste systems, such as employment creation through recycling activities and the construction of waste-to-energy facilities. Finally, the research adds to the larger objective of Tirupattur sustainable urban development, promoting good change for the environment, public health, and the community's socioeconomic well-being.

Objectives of the Study

1. To study the method of collection of municipal solid wastes in Tirupattur municipality.
2. To analyse the process of municipal solid wastes.
3. To examine the disposal of municipal solid wastes.
4. To know the issues and challenges in collection, process and disposal of municipal solid wastes.

Hypothesis

H1: There is no association between the preferred system and level of satisfaction with the present dustbin free system.

METHODOLOGY OF THE STUDY

The researcher selected Tirupattur Municipality for the study. The pilot study was undertaken to assess the variables, and it was appropriate to conduct the research truly, with no limits on declaring variables. To conduct research in a systematic manner and reach a conclusion, the research design is critical. Therefore, the researcher utilized both descriptive and empirical research designs to examine variables. Without data, there is no research. So, the researcher has selected 108 persons as respondents and adopted primary data for the study. To gather data, a well-structured interview schedule was established, and simple random sampling was used to collect the data and variables were systematically arranged and the data collected from the respondent. The collected data were organised and enter into SPSS and it was analysed and presented in the form of tables and discussed the research outcomes.

REVIEW OF LITERATURE

Researchers focus on the variables determining the costs faced by the businesses while researching private involvement. In this study, (Balasubramanian et al.2012) examined the movement of solid waste produced in the Tamil Nadu city of Madurai. For study, 37 solid waste contractors were taken into account. The analysis discovered that the only variable significantly affecting the amount of garbage collected by the contractors is the number of collection visits made each day. According to the report, funding granted for waste management may be strengthened by increasing public and private participation in solid waste management.

Based on Shuchi Gupta et al. (1998), a study on "solid waste management in India: options and opportunities" found that municipal corporations, which are in charge of managing solid waste in India and avoiding a variety of responsibilities related to health and sanitation, have not been very successful in providing solid waste management services. In terms of infrastructure, maintenance, and improvement, the three waste lake components are collection, transportation, and disposal. The collection of waste, however, is the weakest link in the chain of waste management in India.

In Tirunelveli City, Sacratees and Govindraj (2014) estimated the economic expenses of managing municipal solid garbage. Understanding solid waste management practices will help researchers evaluate the costs associated with it for corporations, as well as the effects it has on people's health and their willingness to pay for better solid waste management. As an estimation technique, the contingent valuation method was used. Logit and Tobit models were used to estimate the billing has to pay (WTP), linear regression analysis was carried out to determine the health impacts, a multivariate functional model was used to analyse each activity in the municipality's solid base, and the unit of cost of

waste disposal was used to measure efficiency. I discovered that improper disposal practices result in biological and environmental losses as well as poor sanitation and negative health effects. Infrastructure and poor financial management are some of the study's cited challenges. The report advises municipal corporations to impose a minimum user fee in order to improve municipal solid waste management.

The amount of garbage produced in rural India was also attempted to be estimated by some research. **Samuel (2020)** assessed trash generation sources from my sample village in Kerala's several economic sectors. Primary data, which were gathered from homes, are accurate and come from census data, reports from the Kerala State Pollution and Control Board, and reports from the Central Pollution Control Board. The study village produced an estimated 8% of garbage annually, of which more than 80% was provided by houses, and there was no suitable disposal method in place. The report makes several recommendations, including raising public awareness of waste resource recovery, fixing outdated infrastructure, and rewarding informal garbage collectors. The local government shall implement the right West management policies set forth by the pollution control board when it comes to garbage collecting.

RESULT AND DISCUSSION

Table 1 Generation of Solid Waste

Particulars	Frequency	Percent
Plastic Waste	37	34.3
Paper waste	23	21.3
Food waste	24	22.2
Vegetables waste	24	22.2
Total	108	100.0

Source: Primary data

The above table 1 discuss the large extent of waste generated by the households in the study area. The Majority 34.3 percentage of the households generating the plastic waste in the area and 20.3 percentages of the households generating paper waste and remaining 23.2 percentages of the households are generating both vegetable waste and food waste in the study area. Therefore, it reveals that generation of solid waste has to be reduced and the collected waste also to be reused by the households.

Table 2 level of satisfaction of collection of waste

Particulars	Frequency	Percent
Strongly disagree	43	39.8
Disagree	19	17.6
Neutral	24	22.2
Agree	12	11.1
Strongly agree	10	9.3
Total	108	100.0

Source: Primary Data

The above table 2 describes level of satisfaction of collection of waste that in the study area. Majority 57.4 percentage of the respondents were unhappy about the collection of solid waste. One third of the respondent felt that the collection of solid waste was neutral and remaining 20.4 percent of respondents are felt that the collection of solid waste process was good. Therefore, since 57.4 percent of respondents not at all happy. The solid waste management system ha to be revamped and it has to be practiced well.

Table 3 Status Disposable Facility of Solid Waste

Particulars	Frequency	Percent
Open dumping landfilling	19	17.6
Landfilling	56	51.9
Engineered landfilling	20	18.5
Sanitary landfilling	13	12.0
Total	108	100.0

Source: Primary Data

The above table 3 highlight the status of disposable facility of solid waste. The disposal facility for the final disposal of solid waste are calculated in the study area. The Majority 51.9 percent of waste is disposed in the manner of landfilling in the study area. Remaining wastes are also disposed in the manner of using modern technologies in the processing

and disposal of waste in the study area. The study reveals the landfilling is the only method that helps to dispose and the process the waste in the study area. And the municipalities trying to improve their standard in the collection and disposing of waste from the households.

Table 4 Processing system of solid Waste

Particulars	Frequency	Percent
Landfilling	38	35.2
Incineration	16	14.8
Recycling	15	13.9
Composting	17	15.7
Waste to energy	7	6.5
Source reduction	7	6.5
Others	8	7.4
Total	108	100.0

Source: Primary Data

The above table 4 depicts the most widely used processing system of solid waste. The 35.2 percentage of the solid waste are processed and disposed in the form of landfilling. The 14.8 and 15.7 percentage of incineration and composting method takes next major part in the process and disposal of solid waste in the study area. The landfilling method is most efficiently used to process and dispose the solid waste in the study area.

Table 5 Condition of Waste disposal

Particulars	Frequency	Percentage
Yes	53	49.1
No	55	50.9
Total	108	100.0

Source: Primary Data

The above table 5 illustrates the ways disposable system followed by municipality. Majority 50 percentage of response are saying that there are no proper waste disposal facilities available in municipality in the study area. And remaining 49% of respondents are says that there is proper waste disposal facilities maintained by municipality in the study area. The study reveals waste disposal facilities maintained by the municipality in the study area. The study describes the solid waste disposal take place in the study area and to enforce new kind technologies in the method of waste collection and processing and disposing the wastes.

Table 6 Public awareness about solid waste management

Particulars	Frequency	Percent
Yes	51	47.2
No	57	52.8
Total	108	100.0

Source: Primary Data

The above table 1.6 emphasis public awareness in the waste collection and disposal and management of waste in the study area. Majority 52% of respondents are says that there is no proper public awareness created by municipality for the waste collection and disposal of waste in the study area. And remaining 47% of respondents are says that there is proper public awareness created by municipality for the waste collection and disposal and processing of waste in the study area. This particular study reveals the government should take the initiative to create the public awareness in the public to maintain clean environment in the study area.

CORRELATION

The correlation technique was used to determine the association of appropriate variables in the study. In this study, the preferred system and level of satisfaction with the present dustbin free system were the appropriate variables of correlation. In order to identify the association among these two variable Correlation was used and the following hypothesis was tested.

H1: There is no association between the preferred system and level of satisfaction with the present dustbin free system.

H2: There is an association between the preferred system and level of satisfaction with the present dustbin free system.

Correlation

		Preferred system	Level Of Satisfaction of Present System
Preferred system	Pearson Correlation	1	.732
	Sig. (2-tailed)		.000
	N	108	108
Level of satisfaction in the present system	Pearson Correlation	.732	1
	Sig. (2-tailed)	.000	
	N	108	108

Source: Compilation from primary data

The result of the correlations table shows the preferred system and level of satisfaction is perfectly correlated ($r=1$) based on $n=108$. The Pearson correlation coefficient of the preferred system and level of satisfaction of the present system is 0.732, which is strongly significant ($p < 0.001$ for two tailed test) based on the 108 complete observations. Based on the results, the researcher found the preferred system and level satisfaction with the present dustbin free system have statistically linear relationship ($r=0.732$, $p < 0.001$). the direction of relationship is positive when these variables are tended to increase together. Hence. The null hypothesis is rejected.

FINDING

- The study discovered a significant rise in solid waste creation in Tirupattur municipality over the last decade, with a noticeable increase in household and commercial garbage.
- The composition study revealed a significant incidence of organic waste, plastics, and non-biodegradable materials, emphasising the need for focused interventions in waste segregation methods.
- The existing waste collection and transportation infrastructure was found to be inadequate to handle the growing volume of waste, leading to inefficiencies, delays, and increased environmental risks.
- Limited coverage of waste disposal facilities posed a significant challenge, resulting in reliance on unauthorized dumping sites.
- Soil and water quality evaluations around waste disposal facilities revealed higher levels of contaminants, which contributed to the destruction of local ecosystems.
- Air quality evaluating found that dangerous particulate matter was released during open rubbish burning, posing a health risk to the neighbourhood.
- Numerous improper dumping sites were discovered across Tirupattur, aggravating environmental deterioration and impeding attempts to improve garbage disposal and management.
- The amount of awareness and involvement in trash segregation at the source was found to be inadequate, highlighting the importance of focused community education and engagement initiatives.
- The analysis of existing laws and regulations revealed gaps in enforcement, monitoring, and sanctions for inappropriate waste disposal, highlighting the need for policy reforms and tougher implementation.

SUGGESTIONS

This Specific research was eye-opening for me since it discussed the environmental implications of solid waste management in Tirupattur municipality. The report suggests expanded trash segregation initiatives at the community level to prevent contamination of recyclable items. There is an urgent need for investment in enhanced garbage collection and transportation infrastructure to expedite waste management and processing in the Tirupattur municipality. The government strengthens advocacy for greater enforcement of waste disposal legislation and fines to discourage unlawful dumping. The government should launch community-based efforts to raise awareness and encourage proper trash management methods. These findings highlight the critical need for a comprehensive and sustainable strategy to solid waste management in Tirupattur municipality, along with recommendations for resolving highlighted difficulties and reducing the overall environmental effect of present practices.

CONCLUSION

This study provided a spotlight on the Effectiveness of Dustbin Free System of Solid Waste Management in Tirupattur Municipality. The findings highlight the need of tackling major issues in waste creation, collection, and disposal in order to create a sustainable and environmentally responsible urban environment. The significant growth in solid waste creation, along with inadequate waste management infrastructure, has had a negative impact on Tirupattur local ecosystems. Unauthorized dumping sites compound these issues by adding to soil and water contamination, poor air quality, and general environmental damage.

The Above said recommendations will help to build a more resilient, sustainable, and ecologically conscious Tirupattur municipality. The success of these projects will not only ease current environmental issues, but will also build the groundwork for a healthier and more dynamic urban ecology for future generations. This report is a call to action for all stakeholders to work together to make Tirupattur cleaner and more sustainable.

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