

Methods to Improve Household Solid Wastemanagement in Kollam Corporation

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ABSTRACT: Municipal Solid waste management is one of the major issues which causes environmental problem in India. Solid waste management is defined as the discipline associated with the control of generation, storage, collection, transfer, processing, recycle, reuse disposal and treatment of solid waste. Waste management is a multidimensional problem that requires technology, economics and political activities which goes hand in hand. Various studies have proved that 90% of the wastes are disposed unscientifically which in turn affects the public health and environment. The systems are unscientific, outdated and inefficient, resulting in low population coverage, and the poor are marginalized. Municipal laws that govern the urban local bodies does not have adequate provisions to deal efficiently and effectively with the growing problem of solid waste management. In this study, it is about the understanding of different waste management methods followed and its issues prevailing in the society along with brief details about global waste generation and its impacts. It also gives an idea about what all policies and programs exist in the society to improve the waste management system. The study was pertaining to Municipal solid waste management in Kollam city which has been carried out to evaluate the current status, and to identify the major issues. The study is concluded with few strategies which may help in improving the present waste management method in Kollam Corporation.

KEYWORDS: Solid Waste Management, Pollution, Recycle

I. INTRODUCTION

One of the biggest issues that cities face globally is solid waste management. Municipal solid waste management (MSWM) has become a significant challenge due to the enormous amount of waste produced as well as health and environmental concerns. Urbanization, industrialization, poor urban planning, a lack of necessary resources, and other

factors that contribute to the vast amount of trash generated are the main causes of waste management problems.

Waste can be grouped according to the material it is made of, including plastic, paper, glass, metal, and organic waste. Additionally, wastes that are radioactive, combustible, infectious, poisonous, or non-toxic may be divided into categories based on their potential for danger. The origin of the garbage may also fall into other categories, including industrial, domestic, commercial, institutional, and building and demolition (Rush B, 1999).

One of India's biggest environmental issues is the management of municipal solid waste (MSWM). The Mahatma Gandhi played a significant part in making India clean and green. He had a dream of a clean India. Swachh Bharat Abhiyan is a mission that the Indian government has started. The Mission was launched on October 2, 2014, the 145th anniversary of Mahatma Gandhi's birth, by the Hon. Prime Minister of India, Mr. Narendra Modi. By 2026, the Swachh Bharat mission sought to manage trash for the entire population. The goal was to get 80% coverage by 2019 and then 2% yearly after that.

NEED OF THE STUDY

The increased population, coupled with an unorganised municipal solid waste (MSW) disposal system, stresses ecosystems and interferes with many natural cycles as well as human health. [3] An estimated 1.3 billion tonnes of waste are produced worldwide each year, or 3.5 million tonnes per day, with 54.02% of that waste coming from emerging nations. India produces roughly 62 million tonnes of MSW per year, which causes severe environmental issues (Adipah, 2019). This issue also has an impact on biodiversity, ecosystem health, and the environment. [2] In Asian towns and cities, solid

garbage is typically disposed of in open dumps, which is not the right way of disposal because such unsanitary dumps pose environmental risks and lead to ecological imbalances with regard to land, water, and air pollution (A. Khajuria, 2008).

[3] The biggest issue facing rural communities is solid waste management because it is expensive and gets little attention from UNEP and ISWA (International Solid Waste Association) (United Nations Environmental Programme). It is not just a technological issue; political, legal, socio-cultural, environmental, and economic considerations, as well as the availability of resources, all have an impact (Adipah, 2019).

AIM

To study the challenges with the case of Kollam city in household solid waste management (SWM) faced by urban cities and methods to improve the waste management systems.

OBJECTIVE

The research objectives are:

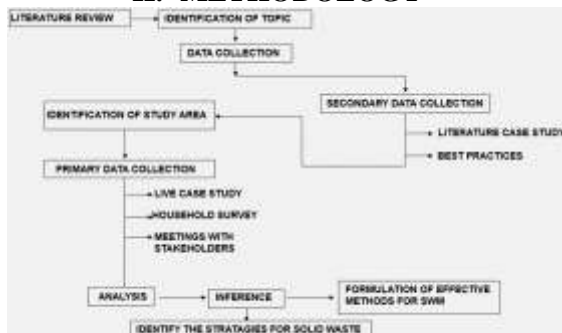
- To understand the composition of Solid waste and issues related with solid waste.
- To understand the practices, policies and programs initiated by government / NGO's in SWM in India.
- To study and analyse the existing SWM methods nationally and internationally through case studies.
- To identify the issues in the current SWM methods with the case of Kollam.
- To formulate effective methods for SWM in India.

LIMITATION

Due to covid restrictions household survey was limited to one ward.

- Study is mainly focused on Domestic Waste Management.
- Sample size chosen for the study is 1 in 20 households

II. METHODOLOGY



III. LITERATURE

[6] Residential (home or domestic waste), commercial, institutional, street sweeping, building and demolition, sanitation, and industrial wastes are the seven groups that make up solid waste or municipal waste (Rush B, 1999). The term "municipal solid trash" also refers to waste that is generated in public areas such as streets, hospitals, businesses, and offices and is frequently the responsibility of municipal or other governmental bodies. Municipal garbage does not include industrial waste. The "collection, transportation, processing, recycling, or disposal of waste materials" is another definition of waste management (Tsai, 2007).

There are various steps in waste management strategies, such as locating the source of the waste, minimising it, and choosing the best methods of disposal. Avoid placing rubbish in one place and sort it into different categories to improve waste recycling. (PDAC, 2009)



Drivers For Transforming Cities into Zero Waste Cities

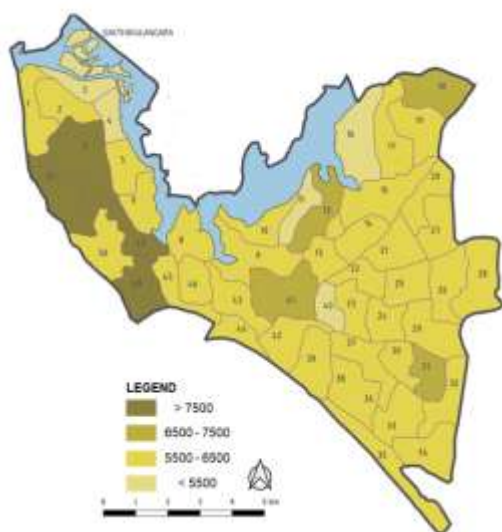
In order to safeguard environmental quality, human health, and the preservation of natural resources, waste management entails controlling the generation, storage, collection, transportation, processing, and disposal of solid waste (Daskalopoulos, 1999).

As a conservation strategy, the emphasis is placed on waste management practises that are environmentally beneficial and focus on reducing, reusing, and recycling both biodegradable and non-biodegradable trash (Crown, 2012).

IV. STUDY AREA

The southern district of Kollam (Quilon) is situated 70 kilometers north of Thiruvananthapuram, the state's capital. The Arabian Sea borders it on the west, Tamil Nadu on the east, the districts of Alappuzha and Pathanamthitta on the north, and the district of Thiruvananthapuram on the south. One of India's more densely populated districts, with a population of around 2.6 million. The Kollam City Corporation

will prioritise socially just development and welfare while a variety of projects will be carried out to transform Kollam into a major metropolis. More solid waste is produced as a result of rapid urbanization, industrialization, population increase, and altered consumer patterns. The most populous ward in the Kollam corporation is ward 51 (Thangasery), which has 8258 residents. The 49th ward was chosen for the study.



Ward Map showing the most populated wards

Ward No.	Total Population	Ward Name	Household Size
51	8258	Thangasery	2041
47	8320	Port	1994
7	8030	Kureepuzha	1853
49	8065	Pallithotam	1901

Ward Wise Distribution of most populated wards

DETAILS OF THE STUDY AREA

Ward No. 49 – Survey Details

In Kollam corporation ward no. 49 is considered as a semi urban area where most people depend on fishing and daily wages for livelihood. Most people living there are BPL family and lacks educational facilities. Due to time limitation and covid constraints, the Sample size chosen for the study is 1 in 20 households.

- **Household size**
 - According to the household survey most of the residents live in group housing with 4 or more members in small plots.
- **Plot size**
 - Most people living here have a plot size of 3 cents.



Two storied Tsunami rehabilitation houses

- **Housing Typology:**
 - Most of the houses are multistoried Tsunami rehabilitation households.
- **Availability of Door – to – Door Collection:**
 - They do not have any facility for door-to-door collection
- **Segregation of Waste:**
 - They do not even segregate the waste for disposal
- **Waste generation – Typology:**
 - Most generated waste in households are domestic waste followed by plastic waste and then paper waste.
- **Waste disposal mechanism – Both organic and inorganic waste:**
 - People living here dispose both organic and inorganic waste into the sea.



Waste carried into the land due to wave

- Only a few people burn the waste that too inorganic wastes. There is no provision of taking plastic waste by Harita Karma Sena.
- **Willingness to use SWM facility within this area:**
 - People in this ward is willing to accept any type of waste management facility as it is the main issue faced by the people living there.
- **Evaluation of present waste management system:**

- People living here are least satisfied about the waste management facility available in their ward.
 - They do not have any provision for disposal.
 - They are least aware about the effects caused due to improper waste management methods.
- **Impact due to improper waste management:**
- Due to improper waste management, it causes huge pollution.



Land pollution due to dumping of waste in the land

- Water pollution due to dumping of waste into the sea.



Air pollution due to burning of waste

- Land pollution as these wastes will be carried into the land due to the wave action where these wastes decompose and produce foul smell.
 - Air pollution due to burning of waste.
- **Need of Kollam municipality to take measures for Waste Management:**
- People living here really want Municipality to take some measures to carry away waste.
 - Waste management is the main issue faced by them.
 - They want some alternate methods to dispose both organic waste as well as plastic waste.
- **Ready to Pay User fee for waste collection:**
- Except a very few, People living here are ready to pay some amount of user fee for collecting the waste.

V. STRATEGIES

Various strategies that can be adopted to improve the waste management system in Kollam Corporation are:

- **Segregation at source:**
- All types of biodegradable waste should be segregated from other types of wastes from the source itself.
 - There should be facilities either for door-to-door collection or closed bins for disposing this segregated waste.
 - Local self-government should take initiatives for the collection process or for the provision of bins and its funding by State Government.
- **Source Treatment:**
- Under this the biodegradable waste generated is treated at home itself through household compost.
 - Source treatment methods like pipe compost, bucket compost etc. can be made available to all people under subsidy schemes (Poothakulam Panchayat) either through central or state.
 - This compost can be dried and outsourced to farmers to use as fertilizers.
- **Collection:**
- The collection services should be outsourced to a community-based network like the Haritha Karma sena.
- **Transfer Stations:**
- Should develop a fully equipped transfer stations/secondary segregation locations for segregation of collected waste into recyclables, non-recyclables, bio medical waste, E- waste and other hazardous waste.
- **Awareness:**
- People should be made aware about the consequences of improper waste management and how it can be achieved successfully. Periodic campaigns and workshops can also be conducted.
- **Promote Public Private Participation:**
- Public private participation in waste management helps in the improvement with the support of private agencies.
 - This helps to come up with expertise, technology, capital, improved and efficiently managed service.
 - Public participation is of paramount importance and can provide big results if used properly.
- **Thumboormozhi Aerobic Bins:**
- Promote of aerobic bins at every ward which acts as a community compost. This can be done as a PPP model. This helps to overcome the Maintenance issues.
- **Formulation of bylaws:**
- The State Government should formulate bylaws that mandate compulsory compost pit in every rural household besides garbage cleaning and proper waste disposal.

- Penalty will be imposed if bylaws are not obeyed.
- **Promote integrated solid waste management system:**
- It is one of the best methods to improve waste management. It includes 3Rs – Reduce, reuse and recycle, waste to energy, energy recovery method, landfill etc.
- **Waste to energy:**
- Introduce new method of pyrolysis for the treatment of waste to electricity in the absence of oxygen.

VI. CONCLUSION

By preventing pollution, solid waste management contributes to safeguarding human health and the environment. This is accomplished by treating both organic and inorganic trash with diverse scientific procedures, such as composting and biomethanation for organic waste and landfilling for inorganic waste. The 3R principle promotes waste minimization through trash reduction, reuse, and recycling. The purpose of this study was to pinpoint the shortcomings in the current system for managing solid waste. Analysis was done on the problems with waste management and the techniques used in Kollam Corporation. Strategies were developed to help the situation as it was.

Strict legislation should be implemented, combined with public awareness campaigns, to ensure proper trash disposal. No new residential or commercial building plan should be approved until it incorporates a suitable facility for waste treatment or disposal. Encourage public-private partnerships where the private sector can provide resources, capital, and services that are well managed. Getting the public involved is crucial for the effectiveness of waste management at all levels.

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