

Solid Waste Management – A Case Study

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Abstract:

Solid waste management has become one of the greatest challenges especially in developing countries. It is a place with increasing population and generates more waste particularly for food related items. Judiciously handling the environmental issues like solid waste management has become necessary for sustainable development of the society. Improper management of Solid waste causes various hazards to inhabitants. Food waste generated in India constitute huge amount of recyclables which can be recovered if we follow the proper solid waste management practices. Improper disposal of solid waste in open dumps and landfills creates lot of problems to Public Health and Environment. Especially the food waste improperly dumped will produce methane gas that produces 21 times greater impact on global warming than carbon dioxide. The main aim of the study is to find out the challenges in managing waste generation till recycling stage and also examines feasibility of technical, economic and environmental aspects of the waste management. This study will be a cross sectional descriptive study. Qualitative method one and one interview, Focus group will be use to analyse the quantity of waste. For Quantitative method data will be collected through semi structured questionnaire. The data received will be analyzed by using SPSS software. Awareness need to be created in each level to minimize the waste and educate on impacts on hazards to health as well to Environment. Implementing the Monitoring and evaluating programs on waste prevention and updating the progress will involve many people in many areas. Recycling strategies will be monitored in all areas. It helps to provide a substantial amount of data regarding the amount and types of waste generated, labor and cost and other related aspects

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1. INTRODUCTION

Waste is unused or unavoidable product of human activity. The waste management is become one of the major problem especially in developing countries this is because of rapid increase of population. In India Guidelines and structure of the policy for the waste management services is very poor due to lack of performance of Municipal agencies that have not been doing their duties properly (19).

In recent trend disposing the waste materials changed as a huge task for the developing countries like India. 90% of the waste is thrown in unused land by using three methods they are

landfilling, incineration, and composting. Landfilling is found to be unsuitable method due to increase in population, lack of landfills and cost barriers. The burning of solid waste in the open dumps will produce nearly 22,000 tons per year which cause severe air pollutant will cause direct exposure to humans (20). The poor maintained landfill sites leads to contamination of ground water it is due to leachate production (24).

The second method is incineration this methods lead various hazardous to environment and also to public. The final method is composting which is considering as a preferable method to manage waste but there is a failure in large scale composting plant in developing countries due to

shortage of simple scientific methods. After analyzing none of this method will be a solution for the solid waste management. Waste disposal till recycling is a process it may incur lot of cost which may create an impact on economy of our nation (1). Waste management includes the activity like collection, transportation, processing, disposal or recycling and monitoring of waste materials (23).

Waste disposal is part of integrated system especially solid waste. Minimizing the waste and recycling process should be given more priority. The local government is responsible for collecting waste till waste separation. The waste can be segregated as Biodegradable waste, Non-Biodegradable waste, compostable waste and reusable waste (2).

The status of the waste management need to be found out since it has become a global issue and political priority. To maintain sustainability on waste management globally we need to face many challenges. Sustainable Development Goals (SDGs) need to be developed. To success the SDGs goal globally certain actions need to be derived. There is interlinking between the climate and the waste (3).

It is become major environmental problems in Indian cities. Many of the solid waste are dumping in open lands will create a larger environmental issues and hazards to the inhabitants. The routine process involved in MSW is generation, storage, collection, transfer, processing and disposal. Out of the six process storage, transfer and processing is not been followed properly it is due to lack of improper planning because of this it become more complex which incur more cost. Unscientific disposal cause various impact to Human Health and to Environment (4)

1.2 SYSTEM OF SOLID WASTE MANGEMENT

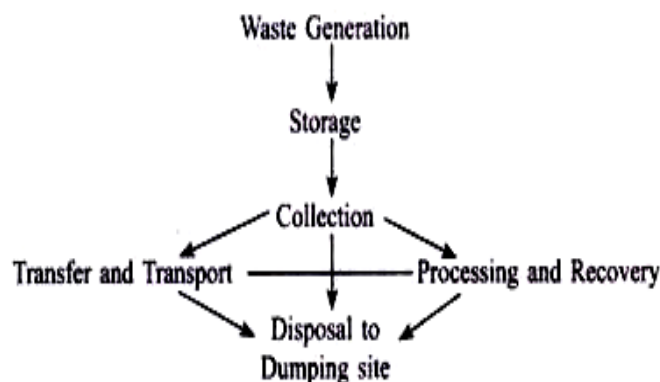


Fig. 17.2 Solid waste management system

1.3 WASTE CATEGORIZATION AND DAILY WASTE GENERATION

The waste component categories of solid waste generated are E-waste, Glass, Leather, Metals, Polythene bags, organic waste (food& garden), plastics, sanitary waste, textile etc. out of this classification the more waste generation items are polythene bags, organic, paper and plastic generate more waste daily (7).

1.4 SOLID WASTE CATEGORIZATION AND ITS TREATMENT METHODS

The Solid waste categorization are Organic waste, Household waste, E-waste, Biomedical waste, Construction and debris, Inorganic waste. The following are the treatment methods which we are using provided below

Organic waste –Bio-composting

Household waste- Bioethanation

E waste- Recycling

Biomedical waste-.Burning

Construction and debris, Inorganic waste -Land filling (22).

The waste which we need more care is the biomedical waste which is generated in medical colleges. There is separate rules was implemented in 1998 and amendment was made twice in 2000 to maintain the biomedical waste. To handle such waste the staffs need more knowledge, attitude and practice. Segregation and collection need to be done in a suitable manner. There is a

significant decrease in awareness seen among members working in Hospitals (15).

The nurses and lab technicians having more and better knowledge how to use biomedical waste but the sanitary staff will have very less knowledge about the BWM. The sanitary staff need more awareness and training about the guidelines. The training program need to be conducted for the workers and monitoring should be done at regular time interval on handling such waste (16).

Knowledge about the HCW categories and treatment as give below as per literature study
Doctors 76.8%, Interns 38.5%, Nurses 81.9%, Technicians 27.3%, Attenders 29.5% and Housekeeping Staff 19.3% (17).

1.5 GENERAL HAZARDOUS OF WASTE MANAGEMENT

Based on the properties of waste it can be classified as hazardous and non-hazardous waste. Hazardous waste can be distinguished as solid, liquid and gaseous waste. HW when comparing to industry educational institutions are facing greater challenges in managing. To handle these waste the staff required strong commitment to train. Improper handling of these waste create lot of Health and Environment problems (8).

The waste which we are dumping in the landfills produce water and air pollution results emission of gas like methane, carbon di-oxide, nitrogen, sulphur and volatile organic compounds. The disposal of waste by using incineration and composting create odours, noise and vermin nuisance (9).

1.6 HEALTH HAZARDOUS

The women living near landfills sites have risk of having a baby it is due to receive of hazardous waste. Apart from this there is also decrease in weight for the new born baby (10)

The waste which thrown in dumpsites has proved there is a problem for the people staying nearby in most of the developing countries. Open dumps

cause major threat to Public Health as well to urban cities environment. The diseases like cholera, malaria, chest pain and diarrhea will cause to the people who are living nearby the sites. The place nearby open dumps are found unsuitable especially for childrens because of flies, incubation, mosquitoes and rodents. Further to these diseases like genetic, dermatological, gastrointestinal, respiratory and other kinds of infectious diseases will be caused (11).

Apart from these very serious disease like cancer, neurological disease will may cause for the surrounding people stay near by dump yards. The mercury toxicity which produced in sea will affect the fish and people who ate will have health hazards. It also degrades our soil quality and water quality (12).

1.7 RECYCLING

The final stage of the waste management is recycling process this is carried out in universities full time or part time. In universities recycling process was done through role accretion which has been monitored through directors (13).

Recycling is become an important role in waste management. Universities plays a major part in recycling as per societal norm. knowledge and social pressure are the two factors that influence recycling process among the students. Motivating students and involve them as a voluntary to make innovation in the universities. Recycling is an activity which is purely based on the adequate knowledge if we not follow proper method it can be very expensive. Educational Institution are the place where most of the young people induct to adulthood by which they themselves knows their responsibility. The recycling behaviour between home and universities is closely related with each other. If the students are not practice to recycle at home will have the same behaviour in colleges so behaviour need to be developed (14).

1. 8 SOLID WASTE MANAGEMENT ASSESSEMENT STATUS IN INDIA

Solid waste management in recent trend it become a most challenging issue to the Government facing a serious problems like pollution because of generation and higher quantities of waste. The composition and quantity will be change from area to area. The government has made an amendment in MSW rule 2018 even there is lot of lacking from the government side to amend the rules they are financial resources, inadequate manpower, machinery requirement and implements. To overcome such situation the government needs to incorporate a strategy plan (18).

1.9 CHALLENGES

Solid waste management emerged has a big challenges due to amount of waste generated on daily basis. In India handling such huge amount of solid waste is become great challenges of Institutional debilities and financial. Due to lack of infrastructure, funds, resources and appropriate strategies improving solid waste management become a huge task. The major challenges are segregation of waste, waste treatment technologies, waste collection by using door to door method, scientific disposal method and land resources. To overcome the challenges Environment ministry made an amendment in Solid waste management rules by the year 2018. But there is a failure in many policies and programs due to insufficient knowledge among stakeholders and poor enforcement (5).

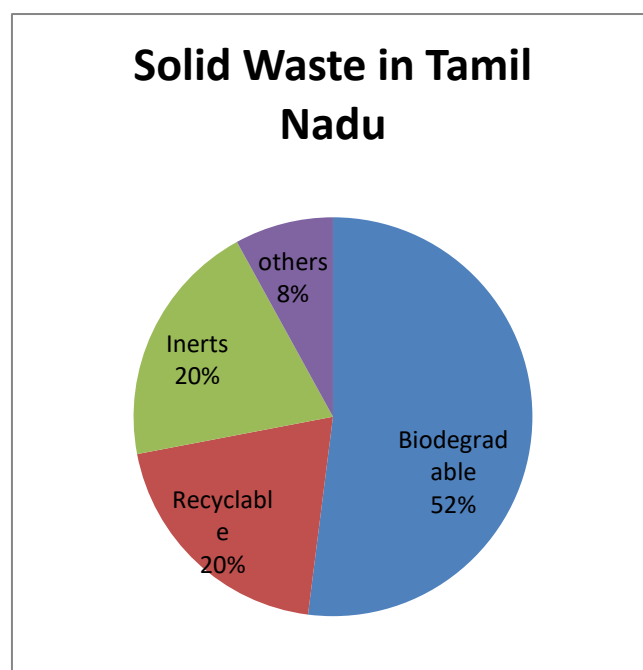
To improve the campus sustainability the universities and colleges need to face many challenges.

To overcome such challenges need a monitoring and evaluation system which help to analyse the quantity of the waste generated on daily basis which will help to overcome the challeges (6).

2.0 SETTING TARGETS FOR WASTE REDUCTION

Reduction of waste generation will become an important factor in future. Industry and the general public plays a key role to implement 5R (Recycle, Reduce, Reuse, Refuse and Repair). Selective buying of required product, less usage of packing and disposal product, Reuse the containers and bags, less usage of paper consumption promote information and communication by using electronic media (22)

2.1 COMPOSITION OF SOLID WASTE IN TAMILNADU



OBJECTIVE

The main objectives of the present study are
To analyze the current scenario about the waste management systems followed from collection till disposal.

To analyze the infrastructure, maintenance and upgradation and availability of the resources.

To understand the public awareness about waste management and their participation from waste generation till disposal.

To analysis the current situation of centralized and decentralized followed in Tamil Nadu.

To compare treatment process like centralized and decentralized.

METHODS AND MATERIALS

This study covered chennai and outer chennai dumpsite. The aim of the study is to identifying the health and environmental impact of the solid waste disposal by the human which they are throwing around the dumpsite. The Health Hazard of the waste pickers and the constraints of separating will also be analyzed. To present the findings on the Health and Environmental impacts caused by the solid waste disposal the Data for this study will be collected from both primary and secondary. The secondary data will be collected through books, journals of both published and unpublished source to gain the background information on health and environmental impact of the solid waste disposal.

Visiting the dumpsite and interview will be conducted among the scavenging and other people randomly. Also interview will be conducted among the Household residents who are living around the surroundings of the dumpsite. Based on the information gathered questionnaire will be developed how to alleviate the problems. To get the solid information structured questionnaires will be designed to households and waste pickers. Questionnaire will be classified as first and second part in the first part data like educational level and employment will be yield. In the second part data will be on views of residents regarding to their dump site location and its surroundings, methods used for disposal by the residents and dump site implication to the health for the peoples staying near to the areas.

Statistical Analysis and Interpretation Plan:

For Quantitative Part:

Data will be cleaned, coded, entered and analyzed in SPSS version 22

Descriptive statistics will be used to describe the study population in relation to relevant variables.

Other required inferential statistical analysis will be done

It will be interpreted using plots, table, bars and charts.

For Qualitative Part:

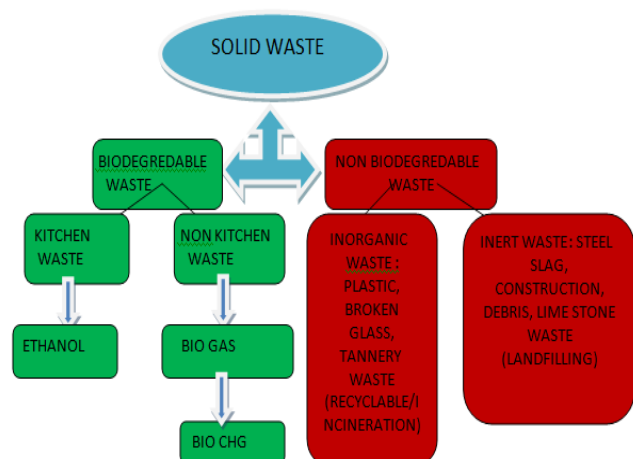
The recording of FGD done will be transcribed in English

The code book will be prepared and the interpretation will be done accordingly

CONCLUSION

The Investigation gives the data about how much of quantity and characteristics of solid waste generated on daily basis. It will find out the biodegradable and non biodegradable fraction and how the biodegradable will be used for bioenergy source and converted into bioorganic fertilizer. Uses of 5R project (Recycle, Reduce, Reuse, Refuse and Recover) will be increased. Awareness campaigns need to be conducted for the peoples so that the corporation burden regarding the proper segregation of waste will be reduced. House to House collection of Solid waste method should be more organized by using the methods like collection of daily waste by using proper scheduling and trimmings. Maintaining proper recycling units will save valuable raw materials and resources of the country and helps us to reduce the need of landfills space. Promotion of the waste management systems will upgrade the living and the working condition of the waste pickers and other marginalized groups. Dumping of waste in the landfills in uncontrolled manner will leads to several health hazardous to human and animals by using composting and vermicomposting it will reduced. It will help us to examine the Environmental and Health impacts of household living near the dumpsites. It will help to note the seasonal analysis of the dumpsites like

pollution during dry and odor during rainy season. Upgradation of technology will provide better quality products which will save our valuable resources of raw materials of our country.



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