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Optimization of Solid Waste Management in Ganapathipuram Panchayat-KanyaKumari District, Tamil Nadu, India

S. R. Rajkumar, C. Aspin*, D. Melbin and R. S. Ratheesh Kumar

Department of Mechanical Engineering, Stella Mary's College of Engineering, Kanyakumari District, Tamil Nadu, India

**Corresponding author*

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A B S T R A C T

Solid waste management may be defined as the discipline associated with the control of generation, storage, collection, transfer, processing and disposal of solid waste. This paper presents the current status of solid waste management (SWM) system of Ganapathipuram town panchayat one of the municipalities of Kanyakumari district, Tamil Nadu, India. The study provides an overview of generation, segregation, collection, transportation, disposal and recycling of municipal solid waste with emphasis on assessment of the type and mode of waste disposal practices followed by the households. The main objective of the study is to identify the major problems and limitations that hinder improvement in the current SWM practices and finally suggest remedial measures. Basic information was gathered from municipality and representative ward members. A detailed field survey was carried out with documentary and photographic investigations and also using a questionnaire which was circulated among the households. The study reveals that the present system of SWM is inadequate, as the average collection efficiency is only 45%-50% of non-segregated waste.

Introduction

Solid waste management is one of the most significant challenges faced by the world today. Rapid urbanization and industrialization in the recent years has resulted in the accumulation of enormous amount of solid wastes all over. According to United Nation's World urbanization prospects report, urban population in the world is expected to reach 66% of the total population by 2050. Solid wastes include all solid materials that the processor no longer considers of any sufficient value to retain. SWM involves the selection and application of appropriate technologies, techniques and management practices to design a program that achieves goals and objectives while minimizing operating costs and environmental harm. Management of solid waste, including the panchayat

solid waste is a major challenge in urban regions of most of the world.

In India, as per 2011 Census, 285 million Indians live in urban area and are expected to rise to 550 million by the year 2021 and 800 million by 2041. With the ever increasing population and urbanization, the waste management has emerged as a huge challenge in the country. Not only the waste has increased in quantity, but the characteristics of waste have also changed tremendously over a period, with the introduction of so many new gadgets and equipment.

It is estimated that about 62 million tons of waste is generated annually in the country, out of which 5.6 million is plastic and 0.17 million is biomedical waste. Waste management has become a serious issue in the state of Tamil Nadu also.

Emergence and re-emergence of infections have forced to open our eyes to the issues affecting environment around. Most of the municipalities in Tamil Nadu have found many difficulties to comply with the rules. In this context, a study on the MSW of Ganapathipuram panchayat in Kanyakumari District of Tamil Nadu, India.

The aim was to prepare a status report of MSWM of Ganapathipuram panchayat with the following specific objectives: (1) to observe and assess the present system (2) to gather information on the problems faced by the residents on the basis of a questionnaire. (3) To suggest a better SWM strategy suitable to the local situation.

Study Area

Ganapathipuram is the southernmost municipality of Tamil Nadu State in the Kanyakumari district. According to the Census 2011; it has a total area of 5.543sq.km2 with a population of 14598. It consists of 15 wards and for the study field observations were made in all the 15 wards of the municipal area to evaluate the present status of the waste generated and disposed.

Materials and Methods

THE 7 R's of Implementation

Recycle
Refuse
Reduce
Reuse
Repair
Re-Gift
Recover

Before Implementation

The waste management will include waste collection, segregation into biodegradable and non-degradable waste and recycling.

The biodegradable waste will be converted into organic manure through compost pits, and the non-degradable waste will be safely disposed of through sanitary landfills.

The goals include awareness generation and behavioral change, elimination of open defecation, integrated city-wide sanitation, safe disposal and proper operation and maintenance of all sanitary installations. The main aim is to reduce the wastes and keep the city clean Reduce, Reuse and Recycle

After Implementation

The awareness given to the workers and peoples, they have feeled the effectiveness of solid wastes and also they started to separate the wastes and throwing wastes in road side, beach side, etc were reduced. The sorting and segregation of solid waste could be done at the house level and it will be easier for biodegradable and non-biodegradable waste to be effectively managed. This segregation could also help in resource recovery of some solid waste that could be recycled to produce fertilizers. Aiming at an efficient biotransformation of organic wastes three different treatment modifications were experimented and changes were plotted in graph.

Results and Discussion

After the awareness given to the workers and peoples, they have realized the effectiveness of solid wastes and also they started to separate the wastes and throwing wastes in road side, beach side, etc were reduced. "Government of Tamil Nadu has issued instructions in all urban local bodies to establish waste processing and disposal facilities.. The main requirements in this regard are the identification of suitable land for locating disposal facilities. The problem of odor nuisances, fly nuisances, water pollution and air pollution can be eliminated.

All the panchayat authorities as well as the district collectors who are responsible for the implementation of the panchayat solid waste management and handling rules, 2000 have been instructed to identify a site away from habitations and water bodies for the composting of compostable wastes and land filling of inert wastes. All the panachayat commissioners have been instructed to take action to stop the disposal of un-segregated panchayat solid wastes into low lying areas and water bodies in order to prevent water pollution.

Stop dumping of garbage at road side, river, beach, ponds etc.

Start segregation of garbage in bins.

Take action to put up waste processing facilities at the earliest

The environment problems arising due to indiscriminate use and disposal of throw away plastic items have been recognized and the Tamil Nadu pollution control board has embarked upon an intensive awareness campaign. The awareness campaign has focused on preventing the use of throw away plastics as well as eco friendly substitutes to plastic items. Billboards educating the people about the ill effects of throwaway plastics were displayed on households. Besides, regular awareness programmes are conducted in panchayat.

The main points of our research is to illustrates that solid waste disposal practice in Ganapathipuram panchayat is to be addressed more seriously. Even though panchayat is responsible for collection and disposal of waste, presently there is no consistent database on waste management. It was, however, observed that there are good waste management practices like collection, separation, disposal methods. It has been found that open dumping which is the crude method of waste disposal is the current practice followed. Similarly, because of poor waste management system, the disposal of solid waste is mostly along the roads and beach banks. The sorting and segregation of solid waste could be done at the house level and it will be easier for biodegradable and non-biodegradable waste to be effectively managed. This segregation could also help in resource recovery of some solid waste that could be recycled to produce fertilizers. It is highly recommended that the four R's (Reduce, Reuse, Recycle and Restoration) of effective management of waste resources should also be implemented for a complete solution to the problem. The reuse of certain products (carry bags, bottles, etc) should also be encouraged. Using Plastic plates, spoons and cups of good quality used for special occasions could be avoided and maximum try to use banana leaf, paper cups, etc. Finally, to efficiently manage panchayat solid waste, there is need for a better initiative and co-operation between the panchayat, public, producers, environmental and nongovernmental organizations. The willingness of the public to pay for improved SWM must be favorably considered for developing economically feasible strategies for solid waste management. From these perspectives we can achieve the much needed goal of sustainable urban solid waste management in Ganapathipuram panchayat Kanyakumari, Tamil Nadu.

Fig.1 Littering of waste in Municipality

Fig.2 Methodology

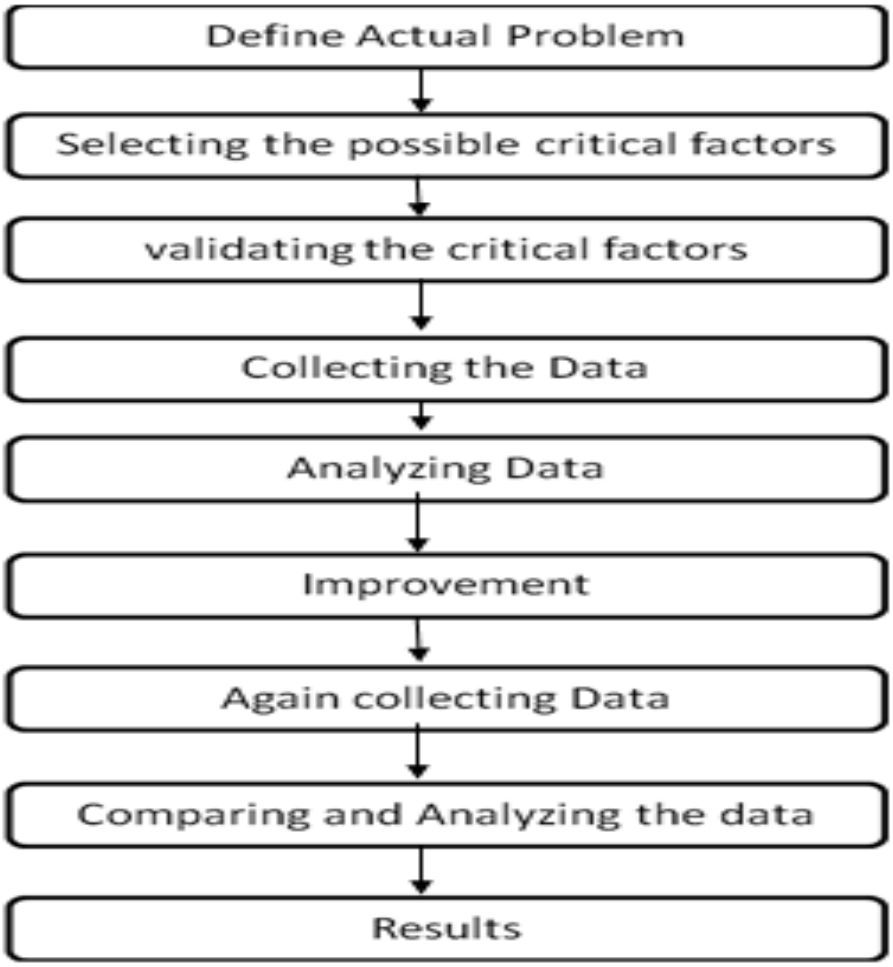


Fig.3 Before Implementation

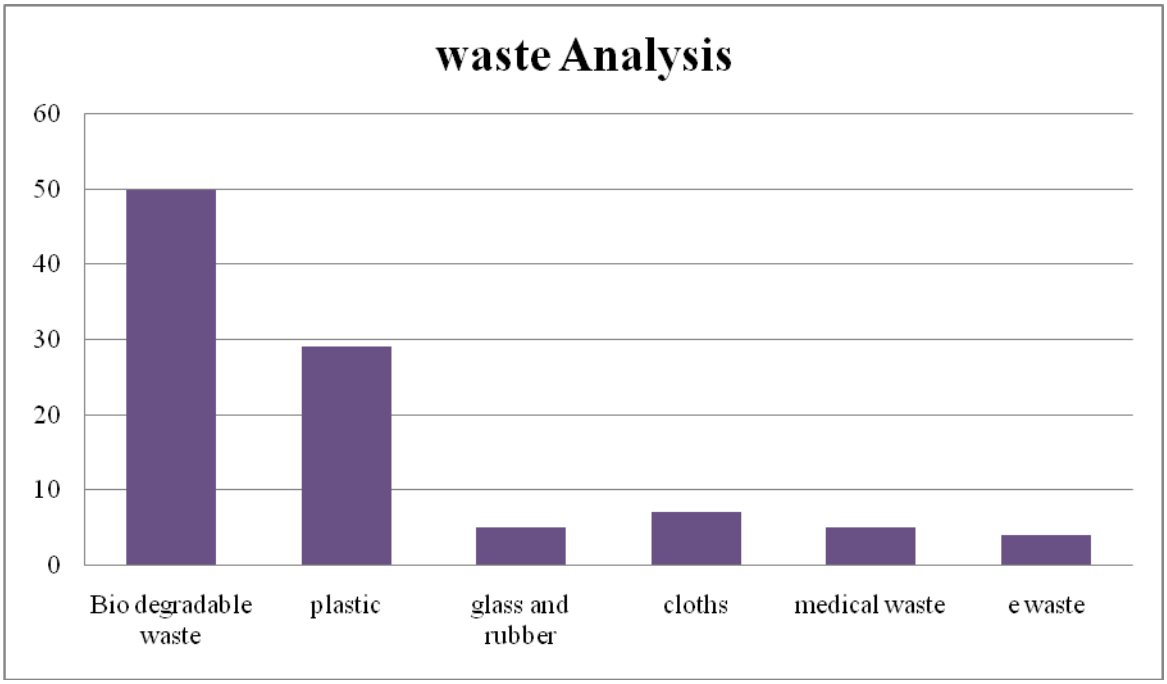
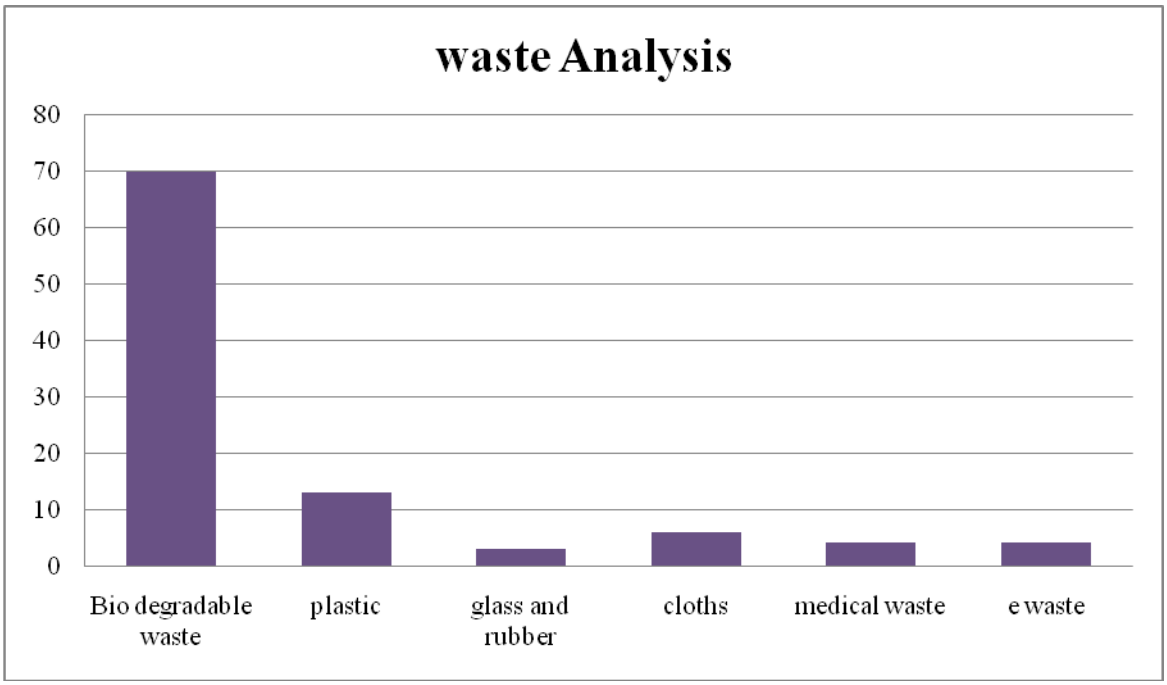


Fig.4 After Implementation



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