A CASE STUDY ON MUNICIPAL SOLID WASTE MANAGEMENT IN HOOVINAHADAGALI CITY, BELLARY, KARNATAKA

Rashmi C L[1], Dr. H.B. Aravinda[2]

[1]PG Student, Department of Civil Engg, B.I.E.T, Davanagere, Karnataka, India
[2]Professor and Head of the Department, Department of Civil Engg, B.I.E.T, Davanagere, Karnataka, India

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Abstract - *It is important to know the solid waste management in small cities too, in this context the work is done to know the waste management in Hoovinahadagali city of Bellari in Karnataka with the population of around 27,967. In the present study solid waste collected at the 5 stations and later characterized. It is estimated that the Average daily weight per household is 2.119Kg, Average Generation rate is 0.343 kg/capita/day, and Density ranges between 100 to 300 kg/m3, Moisture content range 20% to 45%between .Recommendations for solid waste management are made highlighted the importance of waste segregation at the source in order to improve the efficiency of municipal solid waste management in Hoovinahadagali city.*

Key Words: Municipal solid waste, Weighing balance, Physical characteristics of solid waste, waste composition.

1. INTRODUCTION

Solid waste management is a term that is used to refer to the process of collecting and treating of solid waste. The quantity of solid waste generated mainly depends on population, economic growth, and the efficiency of reuse and recycling systems. Under the ambit of "Swachh Bharath Mission" launched on 2nd October 2014, the Ministry of Urban Development (MOUD), Government of India, has stressed that effective municipal solid waste management is one of the important goal to be achieved.

1.1 STUDY AREA

Hoovinahadagali is a town and taluk in the Bellary Distract of Karnataka State, India. Hoovinahadagali is a panchayat town of Bellary district, Karnataka, India. Hoovinahadagali is also known as "Mallige Nadu". And also Hoovinahadagali is well known for Mylara jaatra, which is celebrated annually at mylara. God Mylara Lingeshwara is worshiped there. Hoovinahadagali has 23 wards and the population of Hoovinahadagali town is 23,414 as per 2001 and 27,967 as per 2011. The city covers an area of about19.87 sq.km. The town of Hoovinahadagali is divided into 2 command areas, with an average of 1200 to 1500 Households in each command area. Each command area has been provided with both auto-tippers and push-carts for door to door collection from residential areas.
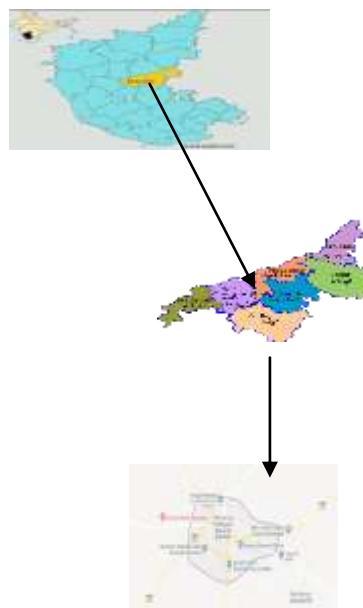
1.2 OBJECTIVES OF THE STUDY

- ➢ To study in detail the existing system of solid waste management in Hoovinahadagali city.
- ➢ Realistic assessment of quantity, characterization and classification of Solid waste in Hoovinahadagali city.
- ➢ To study the average daily weight per households of ward and per capita waste generation rate in Hoovinahadagali city.
- ➢ To analyze the collection and transportation system in Hoovinahadagali city.
- ➢ To recommend any new suggestions to improve the existing MSW system

2. METHODOLOGY

In this project currently an attempt is made for 5 stations covering 23 wards of Hoovinahadagali city by collecting and characterizing the municipal solid waste.

Here the random collection of waste is done from the auto-tipper, after the completion of waste collection from households. The population density is more in station No: 5 compared to the other stations.Station:3 have very less population density.

Station No 1: The station no: 1 have population density of 6154 and the number of households are 1132.

Station No 2: The station no2: have population density of 5150 and the number of households are 1030.

Station No 3: The station no2: have population density of 4647 and the number of households are 1014.

Station No 4: The station no2: have population density of 4860 and the number of households are 1012.

Station No 5: The station no2: have population density of 7152 and the number of households are 5648.

Fig -2.1: waste collection route map in hoovinahadagali city

Station	Auto-tipper no	Wards	Population	House holds
1	KA-35-4294	11,12,13,14,20,21,22	6158	1132
2	KA-35-5730	15,16,17,19	5150	1030
3	KA-35-5725	5,6,7,8	4647	1014
4	KA-35-5724	1,2,3,4,23	4860	1012
5	KA-35-5726	9,10,18	7152	1460
Total			27,967	5,648

Table -2.2: sample collection station details

component	Waste in percentage
Wooden material	6.178
Cloths	1.464
E-waste	1.034
Plastic	20.89
Metal	0.29
Sand/stone/silt	4.8

3.   RESULTS

Table 3.1: Weight of Solid Waste collected from the different stations

Station No	Total weight of the waste(Kg)
1	3.110
2	2.204
3	1.031
4	2.466
5	4.653

TABLE 3.2: COMPOSITION OF SOLID WASTE IN HOOVINA-HADAGALI

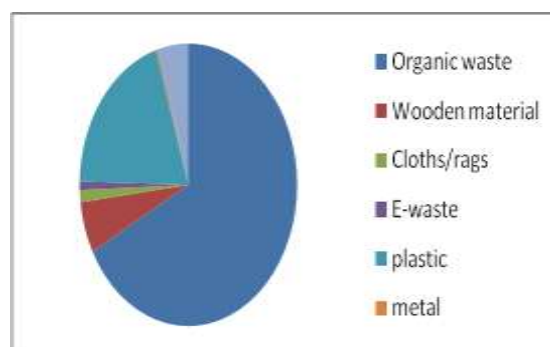| component	Waste in percentage
Wooden material	6.178
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Chart No3.3 : composition of municipal Solid Waste in Hoovinahadagali city

FIG-3.1.1 solid waste dumping site in Hoovinahadagali city

Fig 3.1.2: COMPOSTING PITS

GENERATION RATE:

Generation rate (Kg/capita/day) =

$$\frac{\underline{Quantity\ of\ the\ solid\ waste\ (Kg/day)}}{Population\ (Capita)}$$

Calculation:

Considering station No: 1

Quantity of the solid waste generated in Station No: 1 is 3520.52 Kg/day

Thus,

Generation rate in station No: 1(Kg/capita/day) =

$$= \frac{3520.52}{5722}$$

= 0.615kg/capita/day.

 Thus, Similarly

Generation rate of station No: 1 is 615 grams

Generation rate of station No: 2 is 440 grams

Generation rate of station No: 3 is 224 grams

Generation rate of station No: 4 is 513 grams

Generation rate of station No: 5 is 949 grams

The average generation rate of the Hoovinahadagali city is

$$= \frac{615+440+224+513+949}{5}$$

$$= 548 \text{ Gms}$$

4. CONCLUSION AND RECCOMENDATIONS

By considering the composition of the waste, plastic,   paper/cardboard, food wastes were found to be higher   compared to the other type of wastes like metal, glass. The amount of organic waste is found to be more compared to inorganic waste.

- ➢ The density was found in the range of 100 to 400 kg/m^3. Moisture content of the waste is in the range of 20% to 45%.
- ➢ For Hoovinahadagali city the average daily weight per household is obtained as 2.692 Kg.
- ➢ In Hoovinahadagali city the per capita generation rate is found to be 0.548Kg/capita/day.

Depending upon the volume of waste generated in each   wards the collection vehicles can be provided according to their capacity to carry the wastes. GIS makers made easy way to get the valuable information about the study area in solid waste management. Finally it can be concluded that the city needs enhancement in its management practices and also Municipal Corporation needs to create awareness programs to make a cleaner, better and hygiene atmosphere in Hoovinahadagali city.

RECOMMENDATIONS

- ➢ **For the unscientific practices of waste collection**
  The existing unscientific practices of garbage collection system and disposal of garbage in the drains and open spaces needs to be stopped

- ➢ **For segregation of waste at the source.**
  Presently there is no garbage at the household level. Therefore, distribution of two bins and bag for promoting segregation of waste at the source is recommended.

- ➢ **For waste processing by composting**
  The existing composting needs to increase the rate of composting since the organic waste generation in the city is more.

- ➢ **For waste disposal by landfill.**
  The rejects from the compost plant and the non-biodegradable waste must be disposed off in the sanitary landfill at holagundi road.

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