

# Waste Management System in MCET

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**Abstract**—Sustainable waste management practices have become challenging due to our consumption behavior and changing socioeconomic culture. The aim of waste management is to reduce the dangerous effects of such waste on the environment and human health. With the aid of questionnaire survey, we find that the major type of wastes produced in the college are solid wastes and liquid wastes. Both of these wastes are not disposed in a proper manner. So to rectify this problem, an efficient waste management system is necessary. Thus the design of wastewater treatment plant and a biogas plant has been done.

**Keywords**—Waste management, Foodwaste, Wastewater, Treatment

## I. INTRODUCTION

Waste Management is a major problem in today's world scenario. The problem of treatment and disposal of both solid and liquid wastes is rising and causes threats to the environment. There is no proper management for solid and liquid wastes in the college campus. Therefore, an efficient waste management system is necessary to solve this difficulties.

## II. OBJECTIVES

- To design a wastewater treatment plant for liquid wastes
- To design a biogas plant for solid wastes (food wastes)

## III SCOPE

- Treated water can be used for different purposes other than drinking like cleaning, gardening, etc.
- Biogas generated from the biogas plant can be used as an alternative to LPG

## IV METHODOLOGY

### 1 Questionnaire Survey

Questionnaire survey is conducted in the college among students, teachers, other non-teaching staffs, securities and the workers in the canteen. We have found that there is no proper disposal method for the wastes. So, we conclude that a proper waste management system is necessary.

### 2 Site selection and field survey

The area for the treatment plant is selected and are surveyed. The total area calculated is found to be 6.4 cents.

### 3 Analysis of wastewater

In this, wastewater is tested for various parameters like chlorides, acidity, alkalinity, total hardness and residual

chlorine. These analysis is important so that the chemical characteristics of the wastewater can be determined.

### 4 Calculation of Quantity

The population data in the college is collected. Quantity of wastewater generated is found by multiplying the population with the per capita demand for institutional water demand. The quantity of wastewater is determined by taking 80 percentage of the quantity generated.

### 5 Design of wastewater treatment plant

The design of wastewater treatment plant is done. The treatment plant contain various units like screen chamber, grit chamber, sedimentation tank, trickling filter and aeration tank. Screening is done to separate large floating materials, Grit chamber is used to remove the inorganic materials like glass, gravel, grit, etc. Sedimentation is done for the removal of a part of organic material from the grit chamber.

### 6 Design of Biogas plant

Biogas plant has been designed for the treatment of food wastes,

## V RESULTS AND DISCUSSIONS .

TABLE 1 TEST RESULTS OF WASTEWATER

SL NO	PARAMETERS	READINGS	PERMISSIBLE LIMITS
1	Chlorides	20	250mg/l
2	Acidity	15	6.5-8.5
3	Alkalinity	25	250 mg/l
4	Total Hardness	30	200 mg/l
5	Residual Chlorine	0	0.2 mg/l

### A DIMENSIONS OF SCREEN CHAMBER

Length of Screen chamber = 10 mm

Breadth of screen chamber = 10 mm

Depth of Screen chamber = 50 mm

### B DIMENSIONS OF GRIT CHAMBER

Length of grit chamber = 15 m

Breadth of grit chamber = 1 m

Depth of grit chamber = 2 m

### C DIMENSIONS OF SEDIMENTATION TANK

Length of sedimentation tank = 36 m

Depth of sedimentation tank = 3.3 m

### D DIMENSIONS OF TRICKLING FILTER

Depth of trickling filter = 2 m

Diameter of trickling filter = 40 m

Number of units = 14

#### E DIMENSIONS OF AERATION TANK

Length of Aeration tank = 17 m

Breadth of Aeration tank = 9 m

#### F DIMENSIONS OF BIOGAS PLANT

Capacity of tank = 17.10 cu.m

Internal Diameter = 2.7 m

External diameter = 3.5 m

#### G DESIGN OF SEWER

Diameter of the sewer = 10 cm

#### VI CONCLUSION

On the basis of questionnaire survey, we planned to design a waste management system which includes wastewater treatment plant and a biogas plant. Wastewater is tested for various parameters. Quantity of waste generated is calculated and waste water treatment plant and a biogas plant has been designed.

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