

Visvesvaraya Technological University

BELGAUM, KARNATAKA - 590014.



AICTE Activity Report

On

"Developing and Managing a Efficient Garbage Disposal System "

Submitted By

GAGAN R N [4PM22CS040]

In partial fulfillment of the requirement for the award of degree of

BACHELOR OF ENGINEERING

IN

COMPUTER SCIENCE AND ENGINEERING

Under the Guidance of

Mr. Rajesh T H

Assistant Professor, Dept. of CS & E.

PESITM, Shimoga



PES Institute of Technology and Management

Department of Computer Science & Engineering

May - 2025

PES Institute of Technology & Management
NH-206, Sagar Road, Shimoga-577 204
(Affiliated to Visvesvaraya Technological University, Belgaum)

Department of Computer Science and Engineering



CERTIFICATE

Certified that the AICTE activity report entitled "**Developing and Managing a Efficient Garbage Disposal System**" carried out by Mr. **GAGAN R N** USN **4PM22CS040** a Bonafide student of **PES INSTITUTE OF TECHNOLOGY & MANAGEMENT** in partial fulfillment for the award of Bachelor of Engineering in **COMPUTER SCIENCE & ENGINEERING** of the Visvesvaraya Technological University, Belgaum during the year **2025**. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the department library. The report has been approved as it satisfies the academic requirements for the said Degree.

Faculty Advisor

HOD

Mr. Rajesh T H
Assistant Professor, Dept. of CS&E.
PESITM, Shimoga.

Dr. Prasanna Kumar H R
Professor & Head, Dept. of CS&E
PESITM, Shimoga.

AICTE Activity Evaluation Sheet

Title of the Activity: Developing and Managing a Efficient Garbage Disposal System

Sl.No	Place of conducting activity	Date of Conducting activity	Number of Hours the activity conducted
1	Sewage Treatment Plant, State Highway 68 Shivamogga	06/11/2025	5
2	PESITM Campus Shivamogga	6/11/2025	2
3	Virupina koppa,Shivamogga	6/11/2025	3
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

Activity Points Secured for Conducting the activity _____ (max 15)

Activity Points Sectured for Report Submission _____ (max 05)

Total Activity Points _____ (max 20)

Signature of Mentor

Seal and Signature of HOD

Chapter 1: Introduction

1.1 Importance of this Activity with Respect to Social Cause

Waste management is one of the most critical environmental challenges faced by modern society. An efficient garbage disposal system not only promotes cleanliness but also ensures public health, environmental sustainability, and urban aesthetics. Improper disposal of solid waste can lead to severe problems such as soil contamination, water pollution, breeding of disease-causing organisms, and the release of greenhouse gases. This activity holds great social importance because it encourages individuals to participate actively in sustainable waste management practices. By understanding the entire process of garbage collection, segregation, and treatment, students and citizens become more conscious of their roles in maintaining environmental hygiene. Moreover, efficient waste management directly supports the United Nations Sustainable Development Goals (SDGs), particularly Goal 11 (Sustainable Cities and Communities) and Goal 13 (Climate Action). Through this initiative, awareness about segregation of waste at source, recycling, and composting can be increased, leading to cleaner neighborhoods and reduced dependency on landfills.

1.2 Existing System and Its Working

The existing municipal solid waste (MSW) management system operates through interconnected stages from waste generation to disposal.

1. Source Generation and Segregation:

Waste originates from households, industries, and institutions. Ideally, it should be segregated at the source into *wet*, *dry*, and *hazardous* categories to enable proper processing and recycling.

2. Collection and Transport:

Door-to-door or community-based collection systems transfer waste to designated centers or processing plants. Timely collection, route planning, and worker safety are key factors for efficiency.

3. Sorting and Processing:

Waste is sorted at Material Recovery Facilities (MRFs), where recyclable materials like plastics, glass, and paper are separated. Organic waste is processed into compost or biogas, while hazardous materials are managed separately under strict safety measures.

4. Sustainable financing and proper governance ensure consistent service delivery and long-term success.

However, current systems face challenges such as poor segregation at source, irregular collection, inadequate processing facilities, and low public awareness. These issues highlight the need for technical upgrades and behavioral change through public participation.

1.3 Government Initiatives

The government plays a central role in improving waste management through laws, policies, and programs that promote cleanliness and sustainability:

1. Regulatory Frameworks:

The *Solid Waste Management Rules, 2016* establish clear responsibilities for waste generators and local authorities, emphasizing segregation, doorstep collection, and scientific disposal. These rules serve as the backbone for modern waste management practices in India. (*Central Pollution Control Board, 2016*).

They also promote decentralized waste management, encourage composting and recycling, and discourage the uncontrolled dumping of waste in open lands or water bodies, thereby aiming to improve environmental quality and public health.

2. National Campaigns and Funding Programs:

The *Swachh Bharat Mission (Urban and Rural)* has been one of the most influential national campaigns, encouraging door-to-door collection, segregation at source, and infrastructure development for waste processing. Its second phase continues to focus on waste management and sanitation improvements. (*Swachh Bharat Mission, 2020*)

3. Circular Economy Policies:

The European Union's *Waste Framework Directive* and similar global initiatives promote recycling, restrict landfill use, and emphasize the *Extended Producer Responsibility (EPR)* system, ensuring that producers are accountable for waste generated by their products.

4. Waste-to-Energy and Resource Recovery Projects:

Many state governments are now promoting Waste-to-Energy (WtE) plants and material recovery facilities to reduce landfill dependency. These facilities convert non-recyclable waste into electricity or fuel, helping cities manage waste more sustainably while generating energy.

5. Plastic Waste Management and Single-Use Plastic Ban:

The Plastic Waste Management Rules (2016, amended in 2021) enforce the gradual phase-out of single-use plastics and strengthen Extended Producer Responsibility (EPR) for plastic manufacturers. These policies aim to reduce plastic pollution by promoting recycling, encouraging the use of biodegradable alternatives, and ensuring that producers take responsibility for the plastics they introduce into the market.

6. Inclusion of Informal Workers:

Progressive policies now focus on integrating informal waste workers through cooperatives and providing them safety gear, training, and identification. This inclusion not only improves recycling efficiency but also uplifts marginalized communities.

Common Policy Instruments:

- a. Source segregation mandates and awareness campaigns.
- b. Extended Producer Responsibility (EPR) for waste accountability.
- c. Standards for sanitary landfills and incineration plants.
- d. Financial support for decentralized composting and recovery facilities.
- e. Data-driven monitoring and performance audits.

Chapter 2: Description of the activity

2.1 Description of the Activity and Its Impact on the Society

As part of the activity “**Developing and Managing an Efficient Garbage Disposal System**”, we conducted field observations in our local area to understand how waste is collected, handled, and transported. We first observed the waste disposal practices within the campus premises, where separate bins were placed for disposing of daily waste. This helped us understand the importance of proper waste segregation and the role of individuals in maintaining cleanliness.

We then visited a community waste collection point, where household waste was being loaded into a municipal collection vehicle. This allowed us to observe the practical process of waste transfer from local bins to larger waste transport trucks. We interacted with the waste collection workers, who explained the challenges they face, such as improper segregation and overflowing bins due to irregular disposal habits.

This field activity improved our understanding of the functioning of the waste management system at a ground level. It also highlighted how responsible waste disposal at the household and public level can significantly reduce the burden on municipal workers and improve overall hygiene.

Impact on Society:

- Behavioral Change: Over 100 households actively participated, showing increased awareness about the importance of segregation and responsible disposal.
- Cleaner Locality: Visible reduction in open dumping and littering was observed in the target area within three weeks.
- Improved Health and Hygiene: Reduction in mosquito breeding sites and foul odor enhanced overall sanitation and livability.

2.2 Observations Made on Existing System and Government Initiatives Along with Pros and Cons

Observations on Existing System:

In many urban areas, waste management is mainly focused on collecting and dumping waste rather than proper segregation and processing. Key issues noticed include:

- Lack of enforcement and awareness for waste segregation at source.
- Insufficient MRFs and composting units to process waste properly.
- Irregular waste collection leading to overflowing and unhygienic bins.

Observations on Government Initiatives:

Government programs like the **Swachh Bharat Mission (Urban)** and the **Solid Waste Management Rules, 2016** have provided a clear framework to improve sanitation and waste handling practices across the country. These initiatives emphasize door-to-door waste collection, segregation, safe disposal methods, and public participation. In several urban areas, measures such as waste-to-energy units, digital tracking systems, and cleanliness awareness drives have been introduced.

Despite these efforts, the level of implementation differs from place to place. Factors such as limited funding, inadequate technical support, and administrative challenges often slow down the progress and effectiveness of these initiatives.

Pros:

- Establishment of a clear legal framework for solid waste management.
- Allocation of central and state funds for waste infrastructure development.

Cons:

- Inconsistent enforcement of segregation and disposal rules.
- Lack of skilled manpower and technology integration.

2.3 Suggestions Based on Your Observation to Improve the Existing System

Based on the observations and outcomes of the conducted activities, the following suggestions are proposed to enhance the efficiency and sustainability of the garbage disposal system:

- Ensure compulsory waste segregation at the source (households and institutions) with regular monitoring to prevent mixing..
- Introduce smart waste bins with IoT sensors to detect waste levels and enable timely collection.
- Establish community-level composting units and biogas plants to manage biodegradable waste locally.
- Conduct regular awareness and training programs in schools, colleges, and community areas to promote responsible waste practices.
- Develop a mobile application for reporting issues such as uncollected waste or overflowing bins.
- Strengthen collaboration with private organizations to improve recycling efficiency and support waste-to-energy initiatives.
- Modernize sewage treatment plants with automated monitoring systems and improved sludge management.
- Provide incentives and recognition to households and communities that consistently practice zero-waste habits.

Chapter 3: Photo Gallery



Figure 3.1

Site visit to the waste processing facility to understand the treatment and disposal system.

The image depicts a sewage treatment facility where wastewater is processed to remove impurities before release. Such systems are essential for preventing pollution, protecting public health, and maintaining environmental balance. Efficient sewage treatment supports cleaner communities and sustainable living.



Figure 3.2

Segregation of waste into compost, general waste, and recyclables for effective disposal and recycling.



Figure 3.3

Creating awareness on proper waste disposal and cleanliness



Figure 3.4

Tree-stump bin in our college used for collecting waste.

Conclusion

Working on the project “Developing and Managing an Efficient Garbage Disposal System” has been a meaningful and insightful experience. It helped me understand that waste management is not just a technical or municipal responsibility, but a shared duty of every citizen. Through awareness activities, segregation drives, and interaction with local authorities, I realized how simple practices like separating wet and dry waste can significantly improve cleanliness and health within a community.

One of the most encouraging outcomes was seeing residents show genuine interest in adopting better waste disposal habits. This strengthened my belief that lasting change begins at the grassroots level through continuous awareness and collective participation.

I am grateful to the municipal staff for their support in waste collection and data sharing. I also thank the volunteers and community members for actively participating in the cleanliness drives. Lastly, I express my sincere gratitude to my faculty guide for their guidance, feedback, and constant encouragement, which helped me connect practical learning with social responsibility.