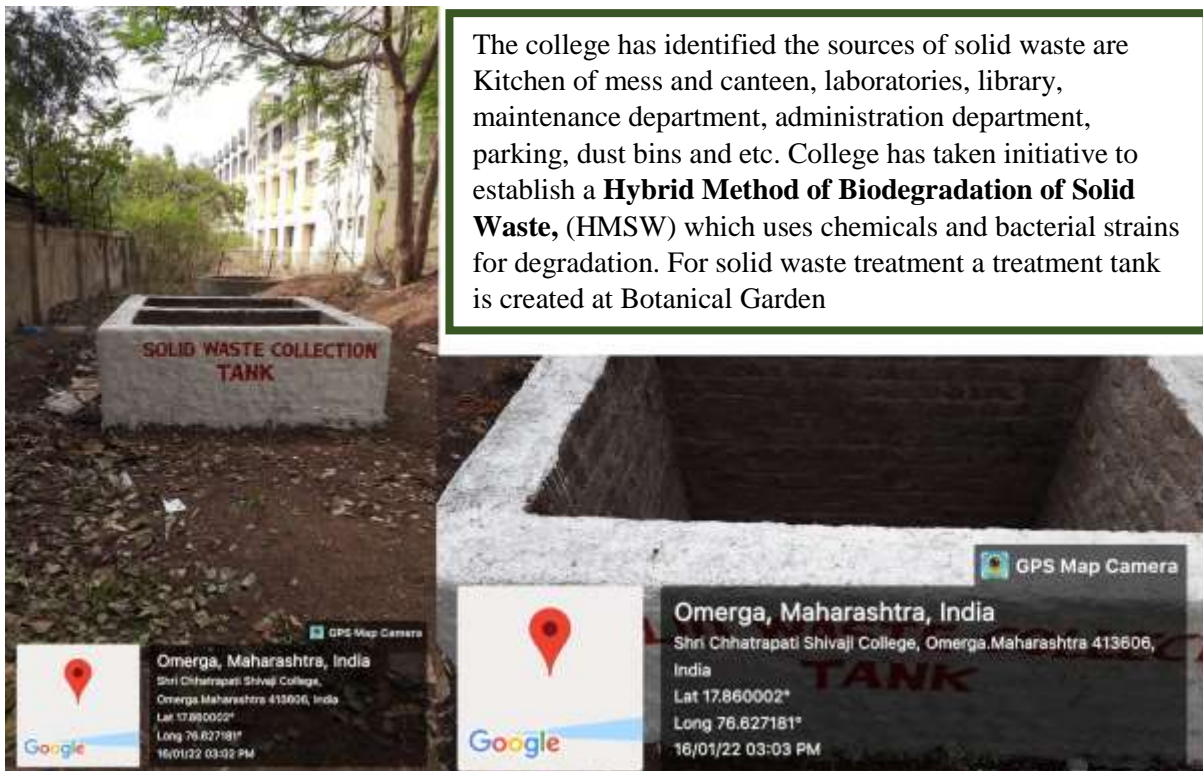


7.1.3 - Facilities in the Institution for the management of the degradable and non-degradable waste:

1. Solid waste management

The college has identified the sources of solid waste are Kitchen of mess and canteen, laboratories, library, maintenance department, administration department, parking, dust bins and etc. College has taken initiative to establish a **Hybrid Method of Biodegradation of Solid Waste**, (HMSW) which uses chemicals and bacterial strains for degradation. For solid waste treatment a treatment tank is created at Botanical Garden.



SCSC Solid waste Management Practices

Management of solid waste/garbage by Chemical decomposition

Introduction

> Solid waste generation is a continually growing problem at global levels. There has been a significant increase in municipal solid waste generation in India in the last few decades. Solid wastes create one of the most visible environmental problems due to rapid population growth and economic development in our country.

> In recent, the quantity of municipal solid waste has been increasing rapidly with growing urbanization and modern lifestyle and its composition changing. One of the serious and growing potential problems in larger urban areas is the shortage of land for waste disposal.

> Effective management can be achieved by controlling the waste generation and taking measures for proper collection, storage, transportation, decreasing volume of solid waste and disposal of solid waste in an environmental and economic manner.

> Integrated solid waste management includes the application of suitable techniques, better management practices and selection of better technologies for waste disposal and management.

> Composting process is slow process (requires about 100-170 days) present in the soil and waste materials considering this fact therefore we have developed speedy compost production method by using certain chemicals.

Abstract

Speedy compost production method has been developed using certain chemicals, such as urea, pyrite, phosphate, Aluminum hydroxide, glucose etc. Optimization has been performed to find out correct composition of Various chemicals to make compost nutrient rich and accelerates the rate of decomposition.

Objectives

> To develop better methodologies for decomposition of solid waste which are efficient and more compatible.

> To find out correct chemicals and its composition to make compost nutrient rich and accelerates the rate of decomposition.

Experimental

- > **Requirement:-** Organic wastes, cow dung, phosphate rock (P2O5), pyrites(FeS2), 13 kg urea(NH2CONH2), Aluminum hydroxide, glucose and soil.
- > **Method of Preparation:-** 5 kg of wastes (dry wt. basis) are spread on the floor followed by 2.5 kg of cow dung, 110 g urea (1.6 % on material wt. basis) is then added. For this, urea is dissolved in 5 liter water and spray a part of solution of urea over the layer. 1.5kg (20 % material wt. basis) of rock phosphate (solution prepared in dilute sulphuric acid was spread over the layer. Then 0.60 kg of powdered pyrites (8 % on material wt. basis), sugar 100 g (1.30 % on material wt. basis), and aluminum hydroxide 50 g (0.66 % on material wt. basis) was added. A portion of finely powdered soil (Approx. 250 g)is then spread. Water is sprayed over the layer to attain 60-70 % moisture. To maintain the moisture and temperature the heap should be covered with a polythene sheet.

The entire process of garbage decomposition is completed within 6-7 weeks and then the temperature becomes normal. The process of Segregation and sieving was done. This method recovers over 90 % to the initial organic matter as compost. The quantitative analysis for presence of nitrogen and Phosphorus was carried out by standard methods.

Role of Chemicals used

- Aluminum hydroxide or bauxite can be helpful for increasing PH, Increasing temperature and also increases the rate of aeration of the composting material. All these changes are expected to facilitate the rate of degradation.
- Rock phosphate or liberated P2O5 enriched with sulphate, it is acting as landfill cover which can enhance biological decomposition.
- Addition of Glucose as instant carbon source into composting mixture also helpful in accelerating the rate of decomposition.
- Presence of urea increases reaction temperature and released nitrogen from urea is useful for organisms because they utilized nitrogen for breaking the organic material.
- Along with this, these chemicals are good source of micronutrients like P, S, N, Fe and Al etc. which are useful for plant kingdom.

References

- ❖ Lilliana Abarca et al., *Waste Management*, 2013, 33, 01, 220
- ❖ Daniel Hoornweg et al., *urban waste Management- global review*, 2012
- ❖ Adane Sirage Ali et al., *International Journal of Waste resources*, 2018, 8, 3, 389

Conclusion

- ✓ There is a noticeable improvement in available nutrient content as compare to ordinary compost. After 40-45 days of decomposition.
- ✓ The observed chemical composition in prepared mature compost are as follows,

N	P	K
1.8-2.1%	1.40-1.53 %	0.90-1.10 %

- ✓ Composting has completed in short time (6-7 weeks)
- ✓ Used chemicals accelerates the rate of decomposition.
- ✓ Easy, efficient and compatible method.
- ✓ Contains good percentage of N, P and K which enhances fertilizing capacity.
- ✓ Further studies are very useful to make this technique effective and addressed scientifically for the wide spread adaptation.

2. Liquid waste management



The college has taken precaution to manage liquid waste by the scientific way. In the college campus majority of liquid waste from latrines and toilet. Secondly, Chemistry lab related liquid waste. To deal with liquid waste toilets and urinals have been connected with underground septic tanks to collect the liquid and sludge. Waste water flow through the septic tanks is channelized to Municipal Water Drainage Collection Channels. Collected Sludge in the Septic tanks is removed with the help of skilled workers from the municipality time to time. Laboratory liquid waste with proper dilution redirected and collected in the specialized soak pits.

3. Biomedical waste management

Sanitary pad and napkins collected as Biomedical Waste in the Covered Plastic bins and carefully disposed in the Biomedical Waste Disposal Pit.

4.E-waste management

E-waste can be described as consumer and business electronic equipment that is near or at the End of its useful life. It is much more hazardous than other waste because electronic components contain cadmium, lead, mercury, and Polychlorinated biphenyls (PCBs) that can damage human health and the environment. E-waste generated in the campus is very less in quantity. The cartridges of laser printers are refilled outside the college campus. Administration conducts the awareness programmes regarding E-waste Management with the help of various departments. The E- waste and defective item from computer laboratory is being stored properly. The institution has contacted approved E-waste management and disposal facility in order to dispose E-waste in scientific manner. E-waste is given to the authorized vendor M/S. Suritex Pvt. Ltd. Certificate of e-waste mgt Form No.6 is provided. Reg. No. MPCB/ROHG/HSMB/AOTLO/16/EW-333 through MPCB wide letter 28.11.2016 valid 19.02.2021.

5. Waste recycling system

College does not have installed waste recycling System. But plastic, glassware waste is recycled by our MoU partners Ashok Bottels and Dhanvi plastic Omerga. Also to maintain the Ground Water Table, college has installed Rain Water System and created Soak Pits wherever necessary.



6. Hazardous chemicals and radioactive waste management:

Colour Coded Bins / bottles are used in the Science Laboratories to segregate the hazardous chemical waste. It is monitored by Laboratory Attendants and Supervised by Concern Academic Staff and Head of the Departments. For Hazardous Waste Segregation Radioactive materials is not used for studies or research work by any of the Departments College. Hence no radioactive waste is generated in the campus.

IQAC Coordinator

Principal