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**Subject:** Environmental Management  
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**Exam:** Mid term

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**Question:** Residents of the university town have launched a complaint about the waste in their area. University town is majorly residential area along with some small scale chemical manufacturing units at its periphery along with some restaurants and a dispensary. You are directed to inspect the area and generate a report which should classify the waste generated, effects of waste and waste treatment methods along with its pros and cons. Also suggest an effective method which would be most suitable for the area.

The population of the area is approximately 8000 each generating 0.12kg/day of solid waste. Moreover, there are 500 houses each generating 50kg/day. The volume of waste generated from the dispensary is estimated to be 2tons/month. Find the waste (assume) generated from the restaurants. Keeping these parameters in consideration, suggest the area required by for dumping the waste with allowable waste depth not exceeding more than 0.5m.

NOTE:

The report should follow the following pattern:

1. Summary
2. Table of contents
3. Introduction
4. Main Body
5. Conclusion

## Problem :

( Environmental management )

Problem :- The population of the area is approximately 8000 each ---  
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Sol: Given Data :-

Population of the area = 8000.  
each generating the solid waste =  $0.12 \frac{\text{kg}}{\text{day}}$ .

houses = 500.  
each house generate waste =  $50 \frac{\text{kg}}{\text{day}}$ .

waste generated from a dispensary =  $2 \frac{\text{tons}}{\text{month}}$   
 $= 2 \times \frac{1000 \text{ kg}}{30 \text{ day}}$   
 $= 66.66 \frac{\text{kg}}{\text{day}}$ .

Let assume waste generated from Restaurant

waste of Restaurant =  $2.5 \frac{\text{tons}}{\text{month}}$   
 $= \frac{2.5 \times 1000}{30} = 833 \frac{\text{kg}}{\text{day}}$

Assume density =  $130 \frac{\text{kg}}{\text{m}^3}$

Sol: waste generated by population =  $8000 \times 0.12 \frac{\text{kg}}{\text{d}}$   
 $= 960 \frac{\text{kg}}{\text{day}}$ .

$$\begin{aligned} (*) \text{ waste generated by houses} &= 500 \times 50 \frac{\text{kg}}{\text{d}} \\ &= 25000 \frac{\text{kg}}{\text{day}} \end{aligned}$$

$$(*) \text{ waste generated by Dispensary} = 66.66 \frac{\text{kg}}{\text{day}}$$

$$* \text{ waste generated by Restaurants} = 83.3 \frac{\text{kg}}{\text{day}}$$

Let find total waste

$$\text{Total waste} = 960 + 25000 + 66.66 + 83.3$$

$$\text{total waste} = 26109.96 \frac{\text{kg}}{\text{day}}$$

the total waste generated / the density  
It will give us Volume.

$$\text{Volume} = V = \frac{26109.96 \left(\frac{\text{kg}}{\text{d}}\right)}{130 \left(\frac{\text{kg}}{\text{m}^3}\right)}$$

$$V = 200.84 \frac{\text{m}^3}{\text{d}}$$

Let find the area.

$$A = \frac{200.84 \frac{\text{m}^3}{\text{d}}}{0.5 \text{ m}}$$

$$A = 401.69 \text{ m}^2$$

Ans

➤ **Table of content:**

- a) Summary
- b) Introduction
- c) Main Body
  - Types of waste generated by a university town area
    - 1. Residential waste
    - 2. Dispensary waste
    - 3. Restaurant waste
    - 4. Chemical manufacturing industries waste
  - Effect of waste
  - Waste treatment method
    - 1. Reuse
    - 2. Recycle
- d) Conclusion

➤ **SUMMARY :**

Residents of the university town have launched a complaint about the waste in their area. University town is a residential area along with dispensary, restaurants and chemical manufacturing industries. We study about university town area and classify the types of waste in that area. We will discuss the effect of waste on environment, human lives and other things. We also study about solid waste treatment method. In final result we suggest the suitable treatment method for the university town area.

➤ **INTRODUCTION :**

Residents of the university town have launched a complaint about the waste in their area. University town is majorly residential area and have some chemical manufacturing units, restaurants and dispensary. We will inspect that area and generating a report in which we classify waste generated from that areas and studying about effect of waste and also the waste treatment methods with advantages and disadvantages. Then we suggest the suitable treatment method for that area.

In that area many types of waste generated for example solid waste and liquid waste .Types of solid waste are vegetable waste, kitchen waste, house hold waste, plastic waste, bottles, wood pieces etc and liquid waste classified as bathroom waste water, kitchen, industrial waste water etc. Waste affect our health, affect our socio economic condition, affects our coastal and marine environment, affect our climate, affect Ground water contamination etc. There are many type of solid waste treatment method reuse, recycle, composting and land filling.

➤ **MAIN BODY :**

Waste is a matter for which a specific owner ceases to have use for it. It is also any unwanted or discarded matter. It can be in a solid, liquid or in a gaseous form. A product, material or container is not considered

waste until someone throws it away. Any unwanted or discarded materials resulting from residential, commercial, agricultural and household is considered as solid waste. Solid waste produces foul smell, breeds, insects and organism besides aesthetic value of the land. Solid waste changes the properties of air, soil and water and also creates the water pollution problems. The essential elements of solid waste management system consists of waste collection, storage and transportation. In general, when SWM systems are considered globally, waste collection and transportation are carried out by local bodies such as municipalities and governments.

### **(TYPES OF WASTE GENERATED BY UNIVERSITY TOWN AREA)**

Let inspect university town area, firstly we discuss about the waste generated from residential area, dispensary, restaurant, chemical manufacturing industries.

#### **1. Residential waste :**

- Residential waste means any waste material, including garbage, trash and refuse, derived from households. There are many types of waste in residential area.
- **Biodegradable waste:** food and kitchen waste, green waste.
- **Recyclable materials:** paper, cardboard, glass, bottles, jars, newspaper, tin cans, aluminum cans, aluminum foil, metals, certain plastics, clothing etc.
- **Electrical and electronic waste:** An electrical appliance, light bulbs, washing machines, TVs, computers, screens, mobile phones, alarm clocks, watches, etc.

#### **2. Dispensary waste :**

Hospital or dispensary waste includes both risk waste and non-risk waste. Following types of waste are produced by hospitals or dispensary in different quantities:

- **“Non-risk waste”** includes paper and cardboard, packaging, food waste, and aerosols and the like.
- **“Risk waste”** means infectious waste, pathological waste, sharps, pharmaceutical waste, genotoxic waste, chemical waste, and radioactive waste.
- **“Sharps”** includes whether infected or not, needles, syringes, scalpels, infusion sets, saws and knives, blades, broken glass, and any other item that could cut or puncture.

#### **3. Restaurant waste :**

There are different types of solid waste generated by hotels/restaurants They include Kitchen Waste, Garden Sweepings, Paper, Books, Cardboard, Plastic, Synthetic Fibre, Glass, Bulb, Rubber, Leather, Metal, Cans, Clothes, Hazardous Waste, Electronic Waste and Others.

#### **4. Chemical industries waste:**

Chemical manufacturing companies, petroleum refineries, paper mills, smelters and other industries. When used incorrectly or inappropriately they can become health hazards. Chemical waste may be toxic, ignitable, corrosive, reactive, or radioactive.

## (EFFECT OF WASTE)

- Solid waste produces foul smell, breeds, insects and organism besides aesthetic value of the land.
- Solid waste changes the properties of air, soil and water.
- Solid waste creates the water pollution problems.
- Affects our health
- Affects our socio-economic conditions
- Affects our coastal and marine environment
- Affects our climate
- Increase is disease transmitting vectors
- Global warming
- Ground water contamination

## (WASTE TREATMENT METHOD)

There are many types of solid waste treatment method but we study two types of solid waste treatment methods.

- 1) Reuse
- 2) Recycle

### 1) Reuse treatment method of solid waste :

- Reuse corrugated moving boxes internally.
- Reuse office furniture and supplies, such as interoffice envelopes, file folders, and paper.
- Use durable towels, tablecloths, napkins, dishes, cups, and glasses.
- Use incoming packaging materials for outgoing shipments.
- Encourage employees to reuse office materials rather than purchase new ones

#### Advantages of Reuse:

- Energy and raw materials savings as replacing many single use products with one reusable one reduces the number that need to be manufactured.
- Reduced disposal needs and costs.
- Refurbishment can bring sophisticated, sustainable, well paid jobs to underdeveloped economies.
- Cost savings for business and consumers as a reusable product is often cheaper than the many single use products it replaces.
- Some older items were better handcrafted and appreciate in value

#### Disadvantages of Reuse:

- Reuse often requires cleaning or transport, which have environmental costs.
- Some items, such as Freon appliances or infant auto seats, could be hazardous or less energy efficient as they continue to be used.
- Sorting and preparing items for reuse takes time, which is inconvenient

## 2) Recycle treatment method of solid waste :

Recycling is the process of converting waste materials into new materials and objects. Many items such as paper, cans and plastic bottles can be recycled to use again.

### Advantages of Recycle:

- Reduces pollution
- Environmental friendly
- Global warming
- Landfill sites
- Supplies valuable raw materials to industry
- Conserving natural resources
- Creates jobs.
- Energy consumption

### Disadvantages of Recycle:

- **Capital costs:** building a recycling unit center requires huge capital. The accompanying costs like vehicles, new bins, infrastructure costs, schooling the community about recycling and creating awareness programs are very expensive and time consuming.
- **Quality:** most of the recycled materials are not durable. They do not last long because the raw material has been reused.
- **Not widespread:** even though recycling plays a big role in society at large, not many people have embraced it. Recycling takes place at home and schools but most local and global industries are not practicing this. Awareness of recycling does need to stop at school or in our homes. The amount of chemicals released in industries is way more than waste is thrown out in schools and homes.

### ➤ Conclusion:

In final result we suggest the **Recycling** of solid waste treatment method for university town area because this method has few disadvantages, there are more advantages to it. This treatment method is environmental friendly, reduce pollution and creates jobs.

Now a day solid waste management is a vital, ongoing and large public service provision, which needs to be efficiently provided to the community to maintain aesthetic and public health standards.

Considering the nature and components of waste generated by households, dispensaries, chemical manufacturing industries, hotels or restaurant and business places, the waste reduction, reuse, recycling and composting processes would be suitable in managing the solid waste. Public education and properly planned waste management programs also need to be introduced into the current waste management system. Especially awareness programmes must be conducted in order to improve the knowledge about the importance of SWM for sound environmental development in the area.

**THE END**