

**IQRA NATIONAL UNIVERSITY PESHAWER**



**Paper:**  
**ENVIRONMENTAL MANAGEMENT**

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**B-tech(civil)**

**6<sup>th</sup> semester**

**Asadullah**

**To : Muhammad Hasnain**

**ID: 14024**

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# **Waste management of university town**

## **SUMMARY**

Residential waste, which consists mostly of food wastes, liquid waste plastics, paper, ash, textiles etc. Chemical manufacturing units are producing some Chemical waste which may include harmful or dangerous chemicals and chemical residue. And also produce some other wastes which are different types of materials, including paper, cardboard, plastics etc. Rrestaurants produced some amount of food scraps and paper etc. From the dispensary wastes are bottles, boxes, syringes, products wrapped in plastic etc. without the managing of these waste it's can be effects the environment. Waste handling and sorting involves the activities associated with management of wastes until they are placed in storage containers for collection.

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# Waste management of university town

## 1 Introduction

Virtually every resident, organization, and human activity in the University Town generates some type of waste. Many different types of waste are generated, including municipal solid waste, Solid Rubbish, Plastic waste, Paper/card waste, Tins and metals Ceramics and glass, Organic Waste like food scrape.

In chemical manufacturing units generates some amount of chemical waste which include harmful chemical and also generate some amount of solid waste including paper, cardboard, plastics, packaging materials, wood, and scrap metal.

Waste generate from restaurants Food Scraps Some different types of food scraps include excess bits produce, uneaten food, or expired products. restaurant Paper Supplies Some source of paper supply waste include used paper towels, beverage containers, napkins, and bags. waste generates from Dispensary are plastic bottles, boxes, syringes etc.

## 2 Waste generate from Residential:

Residential waste, which consists mostly of food wastes, plastics, paper, ash, textiles etc.

### 2.1 Liquid waste:

The liquid wastes from residential areas are often referred to as domestic wastewaters. These wastewaters come from our day-to-day living and include those from food preparation, washing, bathing and toilet usage. Liquid waste from domestic sources can be classified as Blackwater, which contains excreta, and greywater, which does not.

### 2.2 Solid Rubbish

Solid rubbish is commonly broken down into the following types:

#### Plastic waste

This consists of bags, containers, jars, bottles and many other products that can be found in your household. Plastic is not biodegradable, but many types of plastic can be recycled. Plastic should not be mix in with your regular waste, it should be sorted and placed in your recycling bin.

#### Paper/card waste

This includes packaging materials, newspapers, cardboards and other products. Paper can easily be recycled and reused so make sure to place them in your recycling bin or take them to your closest Brisbane recycling depot.

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## **Tins and metals**

This can be found in various forms throughout your home. Most metals can be recycled. Consider taking these items to a scrap yard or your closest Brisbane recycling depot to dispose of this waste type properly.

## **Ceramics and glass**

These items can easily be recycled. Look for special glass recycling bins and bottle banks to dispose them correctly.

### **2.3 Organic Waste**

Organic waste is another common household. All food waste, garden waste, manure and rotten meat are classified as organic waste. Over time, organic waste is turned into manure by microorganisms. However, this does not mean that you can dispose them anywhere.

Organic waste in landfills causes the production of methane, so it must never be simply discarded with general waste. Instead, look to get a green bin, or hire a green skin bin or garden bag for proper waste disposal.

## **3 chemical manufacturing units**

Here are some facts about the different categories of chemical manufacture units waste.

### **3.1 Chemical Waste**

Chemical waste is typically generated by factories, processing centers, warehouses, and plants. This waste may include harmful or dangerous chemicals and chemical residue.

### **3.2 Solid Waste**

In industrial services, solid waste includes a variety of different materials, including paper, cardboard, plastics, packaging materials, wood, and scrap metal.

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## **4 Waste generate from restaurants:**

### **4.1 Food Scraps**

Food scraps create the bulk of waste that is created by an average restaurant. Some different types of food scraps include excess bits produce, uneaten food, or expired products.

### **4.2 Paper Supplies**

Depending on the style of restaurant, this may create large amounts of paper waste on a day to day basis. Some source of paper supply waste include used paper towels, beverage containers, napkins, and bags.

## **5 Dispensary:**

Whenever anyone buys legal weed at a licensed pot shop, their products are packaged in plastic. Whether it's bottles, boxes, syringes, products wrapped in plastic, these packages ultimately end up in landfills, which contribute to a whole host of environmental problems.

## **6 Effects of waste:**

### **6.1 Impacts of solid waste on health**

The group at risk from the unscientific disposal of solid waste include the population in areas where there is no proper waste disposal method, especially the pre-school children; waste workers; and workers in facilities producing toxic and infectious material. Other high-risk group include population living close to a waste dump and those, whose water supply has become contaminated either due to waste dumping or leakage from landfill sites. Uncollected solid waste also increases risk of injury, and infection.

In particular, organic domestic waste poses a serious threat, since they ferment, creating conditions favourable to the survival and growth of microbial pathogens. Direct handling of solid waste can result in various types of infectious and chronic diseases with the waste workers and the rag pickers being the most vulnerable.

Exposure to hazardous waste can affect human health, children being more vulnerable to these pollutants. In fact, direct exposure can lead to diseases through chemical exposure as the release of chemical waste into the environment leads to chemical poisoning. Many studies have been carried out in various parts of the world to establish a connection between health and hazardous waste.

Disposal of health-care wastes require special attention since it can create major health hazards, such as Hepatitis B and C, through wounds caused by discarded syringes. Rag pickers and others who are involved in scavenging in the waste dumps for items that can be recycled, may sustain injuries and come into direct contact with these infectious items.

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## 6.2 Diseases

Certain chemicals if released untreated, e.g. cyanides, mercury, and polychlorinated biphenyls are highly toxic and exposure can lead to disease or death. Some studies have detected excesses of cancer in residents exposed to hazardous waste. Many studies have been carried out in various parts of the world to establish a connection between health and hazardous waste.

## 6.3 The role of plastics

The unhygienic use and disposal of plastics and its effects on human health has become a matter of concern. Coloured plastics are harmful as their pigment contains heavy metals that are highly toxic. Some of the harmful metals found in plastics are copper, lead, chromium, cobalt, selenium, and cadmium.

## 7 Types of Treatment /Disposal methods

1. Incineration
2. Deep burial
3. Secured landfilling
4. Chemical disinfection
5. Steam sterilization (Auto calving)
6. Thermal deactivation
7. Irradiation and microwave treatment

## 8 INCINERATION METHOD OF SOLID WASTE DISPOSAL

The main purpose of solid waste management is to minimize the adverse effects on the environment. The steps involved are:

1. Collection of solid wastes
  2. Disposal of solid wastes
  3. Utilization of wastes
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## 8.1 COLLECTION OF SOLID WASTES

- Collection of waste includes gathering the waste, transporting it to a centralized location, and then moving it to the site of disposal.
- The collected waste is then separated into
  - Hazardous
  - Non-hazardous materials.

## 8.2 DISPOSAL OF SOLID WASTES

- Before the final disposal of the solid wastes, it is processed to recover the usable resources and to improve the efficiency of the solid waste disposal system.
- The main processing technologies are:
  - compaction
  - Incineration
  - Manual separation.
- The appropriate solid waste disposal method has to be selected, keeping in view the following objectives:
  - Should be economically viable
  - Should not create a health hazard
  - Should not cause adverse environmental effects
  - Should not result in unpleasant sight, odor, and noise

## 8.3 UTILIZATION OF WASTE

- The solid wastes can be properly utilized to gather the benefits such as:
  - Conservation of natural resources
  - Economic development
  - Generate many useful products
  - Employment opportunities
  - Control of air pollution

## 9 Incineration is the process

- Incineration is the process of control and complete combustion, for burning solid wastes. It leads to energy recovery and destruction of toxic wastes.
  - In these plants the recyclable material is segregated and the rest of the material is burnt. Example: waste from hospitals
  - In some newer incinerators designed to operate at temperatures high enough to produce a molten material, it may be possible to reduce the volume to about 5% or even less
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- One of the most attractive features of the incineration process is that it can be used to reduce the original volume of combustible solid waste by 80–90%.

## **9.1 ADVANTAGES:**

- The amount and volume of the MSW can be reduced significantly (up to 90% by volume and 75% by weight); Waste-to-energy.

## **9.2 DISADVANTAGES:**

- Not all waste can be burned (There will still be landfills)
- Release hundreds of toxic chemicals into the atmosphere;
- Disposal of the ash (The toxic substances are more concentrated in the ash)
- Highly related to the economic condition
- A classic short-term solution (it destroys) material by turning it into toxic ash.

## **10 Conclusion and recommendation**

Waste can be classified into different types of waste which is all commonly found around the house. These include liquid waste, solid rubbish, organic waste, and hazardous waste. Make sure that you segregate your waste into these different types to ensure proper waste removal. Households in the study area do not receive adequate solid waste management services and they are adversely affected by improper solid waste collection. The per capita waste generation is found to be the lowest in the outer zone and highest in the core zone. Thus, the low per capita waste generation in the outer zone may be due to the household sorting of waste more intensively in the outer zone than in other zones. Most households feel that the lack of stiff penalty and non-execution of law is the basic problem for the effective management of waste. Thus, provision of strong penalties and effective execution of the law will be the major tool to reduce the problem of solid waste management in university town. It is found that environmental awareness is very low among the residents of the city. Thus, stringent regulations with environmental awareness programs for household sorting and composting can reduce the volume and quantity of waste for land filling. Based on our case study findings, the following is recommended:

There are no any type Biogas plants used by many factories in and around Bahir Dar city to generate electricity from solid wastes generated from resident households. Government could make it mandatory for factories/poulties/farms generating a certain amount of solid waste to have biogas plants. Certain tax incentives could also be given to those complying with these new regulations.

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Given:

Population of area = #8000

solid waste produced by each = 0.12 kg/day

Number Total houses = #500

Each produced waste = 50 kg/day

Waste produced from

dispenser = 2 tons/month

$$= \frac{2 \times 1000}{30}$$

$$= 66.67 \text{ kg/day}$$

$$\text{depth} = 0.5 \text{ m}$$

Assume data:-

waste generate from  
restaurant = 120 kg/day

$$\text{Density} = 126 \text{ kg/m}^3$$

Required:-

Area for dumping of  
the waste. the depth  
should not exceed 0.5m.

## Solution:

waste produced by population

$$= 8000 \times 0.12$$

$$= 960 \text{ kg/day}$$

Waste produced by houses:-

$$= 500 \times 50$$

$$= 25,000 \text{ kg/day}$$

Waste produced by dispenser

$$= 66.67 \text{ kg/day}$$

waste produced by restaurant.

$$= 120 \text{ kg/day}$$

Total waste :-

$$= 960 + 25,000 + 66.67 + 120$$

$$= 26,146.67 \text{ kg/day}$$



Volume of waste:

$$\rho = \frac{m}{V}$$

$$V = \frac{\text{mass of waste}}{\text{density}}$$

$$= \frac{265146.67 \text{ kg/day}}{126 \text{ kg/m}^3}$$

$$V = 207.51 \text{ m}^3/\text{day}$$

Area for Dumping:

$$A = \frac{\text{Volume}}{\text{depth}}$$

$$= \frac{207.51}{0.5}$$

$$A = 415 \text{ m}^2/\text{day}$$

The area for one day is

$$415 \text{ m}^2$$