

Annual Dumping volume can be calculated from the Equation-A.

$$\text{Annual Dumping Volume} = \frac{\text{Dumping Volume}}{\text{Dumping Periods (Year)}} \longrightarrow \text{Equation-A}$$

From the calculation in Table-33, total dump volume is 1,378.97 m³. So by using Equation-A, Annual dumping volume of the solid waste in Phase-VII is 229.83m³. Since 1st January 2004, a new site located at a distance of 15 Km from Hayatabad along the ring Road between Bara Chowk and Kohat road is used for waste dumping. This site is far away from the Hayatabad area, so only the waste collected by trucks are disposed off. An estimated 10-15 tons of waste is now being dumped per day.

Since 1st to 28th January 2004, after the abandonment of Phase-VII site, donkey carts use to dump the waste in excavated areas of Kacha Garhi Camp (opposite Hayatabad Township). This particular site has been abandoned too after public complaints. Since 28th January onwards, waste is being disposed by donkey carts in an excavated area within the premises of Sewage Treatment Plant in Phase-III.

As per discussion with the Sub Divisional Officer, In-charge for Solid waste collection and disposal in Town-III, there are all temporary arrangements and they are trying to find some permanent site for waste disposal.

Following Table-36 below summarizes the main distinguishing characteristics of the dumping site in Phase-VII, Hayatabad.

TABLE-36

KEY CHARACTERISTICS OF SOLID WASTE DUMPING SITE IN HAYATABAD

Characteristics	Advantages	Disadvantages
<ul style="list-style-type: none"> • Poorly site • No planning • Little or no site preparation • No leachate management • No gas management • Only occasional cover • No/Little compaction of waste • No fence • No record keeping • Waste picking/selling 	<ul style="list-style-type: none"> • Easy access • Low initial cost • Low initial cost • Low initial cost • Low initial cost • Aerobic decomposition • Aerobic decomposition • Access to waste pickers • Low initial cost • Material recovery/income 	<ul style="list-style-type: none"> • Environmental contamination • Noxious site • Unsightly, needs remediation • Ground water or surface water contamination • Risk of explosion, Green House Gases • Vector/disease, unsightly • Shorter, lifetime little • Indiscriminate use • No record of landfill contents • Risk to Scavengers health

2- QUALITY OF WASTE

In this section, the quality of Solid waste generated in Hayatabad area will be discussed. Also recovery of saleable items by scavengers and discard materials by weight and by percentage of generation will be discussed.

2-1 Apparent Specific gravity

The main source of garbage collection in Hayatabad is donkey cart. The average volume of the loaded donkey carts were measured, which comes up 1.36m^3 . The average weight of garbage was measured on carts, by measuring the weight of loaded and unloaded carts, which is 0.72 tons. So the apparent specific gravity of the loaded donkey cart is 0.53 t/m^3 .

The owner of the donkey carts segregate the solid waste on source during collection on door to door. So the volume and the weight of the donkey carts with saleable and non-saleable items were measured during this study.

2-2 Composition of Solid Waste

According to the survey conducted, a fully loaded donkey cart was weighted on a computerized weighing machine at a facility available in Lahore Steel Mills, industrial estate, Hayatabad and thus the total waste came as 720 Kg. The weight was mixed thoroughly and divided into two equal sections. Two sections were chosen and then mixed again thoroughly and again separated them into four sections. This process was repeated again and finally about 90 Kg portion was taken for segregation. The following diagram shows the path of sampling test for the determination of composition of solid waste.

FIGURE-10

SOLID WASTE SORTING PROCESS FOR QUALITY CHECK

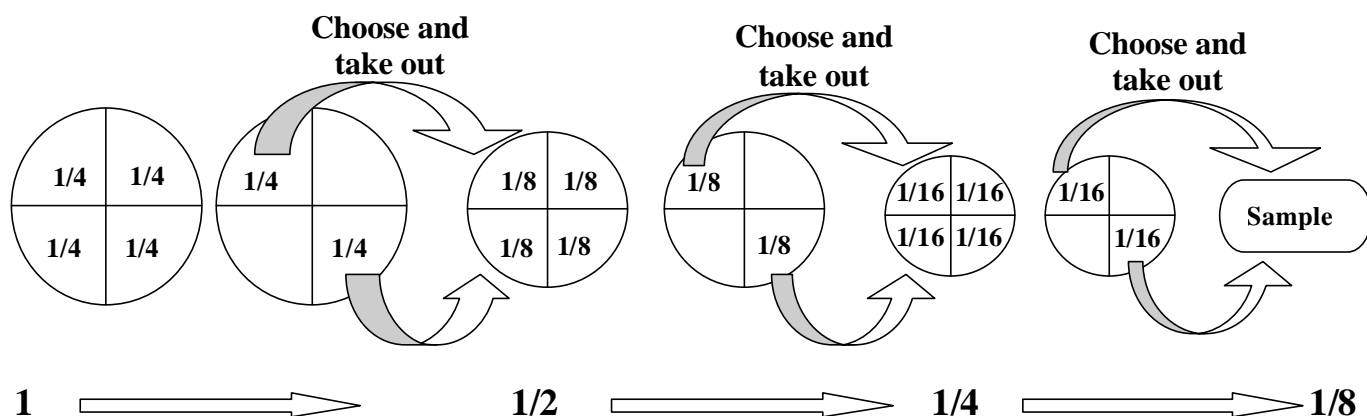


TABLE-37

SOLID WASTE COMPOSITION

Items	Weight (Kg)	% of Discard Waste
Total weight	720	
Non-Saleable Items	650	90.3
○ Vegetables/fruits/other organics	20	2.8
○ Pampers	10	1.4
○ Used tea leaves		
Saleable Items		
○ Plastic, Rubber	8	1.1
○ Textile	4	0.5
○ Paper	8	1.1
○ Metal	2	0.3
○ Glass	4	0.5
○ Bones	6	0.8
○ Wood	3	0.4
○ Bread	5	0.7

Table-37 shows that the high percentage of discard waste about 90% is vegetables/fruits and other organics like kitchen waste. Most of the discard vegetables/fruits are consumed by the carts owner for feeding their animals.

The second highest percentage of discard non-saleable item is pampers (diapers). Pampers are 3% among non-saleable items, which go to the dumping site.

The break down of saleable and non-saleable item is solid waste (in percentage by weight) are shown in Figure-11 and 12. Figure-11 shows the percent generation and discard of items to the dumping sites. While the Figure-12 shows the percent generation and recovery of saleable items by either scavengers or by cart owners.

3- SOLID WASTE RECYCLING

3-1 Quality and Quantity of Picked Waste

As discussed earlier, saleable items are picked from the solid waste discard and sold in Kabari shops (those shops, who buy used items or saleable items collected from solid waste). No Kabari shops are allowed to operate inside the Hayatabad town area. However, there are approximately 20 shops on the Jamrud Road opposite Hayatabad Town, where 90% items come from Hayatabad area, while 10% come from Kacha Gari (Afghan refugees camp). Table- 38 shows the average weight of various saleable items receive at a typical Kabari shop per day. Survey was conducted in 20 shops to find out the total weight of saleable items. Therefore total weight of various items do vary from the average weight. However, the following average was estimated for single day survey.