



SOLID WASTE CHARACTERIZATION STUDY BRIEF FOR PORT MORESBY - NATIONAL CAPITAL DISTRICT 2011

1. Introduction

Basically, Waste Characterization is the analysis, sorting and categorizing of Solid Wastes for the purpose of understanding the composition and quantity of the waste in order to develop the necessary system to manage waste. The Waste Characterisation study is conducted as part of the JPRISM project output three (3) for the purpose of developing the Solid Waste Management plan and also the cost analysis of the Solid Waste Management developed and monitored periodically.

2. Purpose

To increase the capacity of planning and monitoring of Solid Waste Management in Port Moresby (National Capital District)

3. Objectives

- To determine the capacity required for on-site storage, transportation, transfer facilities and disposal of solid waste
- To identify re-cycling/resource recovery potential of solid waste
- To determine appropriate methods of collection and disposal of solid waste
- To estimate the expected life span of a disposal site

4. Specific Objectives

To find out and determine the following waste data and information:

1. Generation rate of the domestic solid waste (kg/ person/day)
2. Composition of the generated domestic solid waste.
3. Volume and density of the generated domestic solid waste

5. Methodology

The survey was carried out in accordance with the standard procedures set under the WHO Solid Waste Generation and Characterization Guidelines.

(Please state who carried out the survey and if possible the cost for implementing the survey. Also include the Waste Management Division staff that supervised the Survey.)

6. Study Area

For Domestic waste three (3) suburbs located in the North West electorate of NCD were selected according to the social economic status of the residents, Morata - low level income earners, Rainbow - middle income earners and Islander Village - high income earners. Commercial Waste study involved business establishment located in MNW and MNE electorate according to the business activities.

(If possible insert map of the city and show the survey locations on the map)

To facilitate the selected methodology, Garbage Bag collection was recommended.

7. Preparation

For the purpose of the study, 70 residential households were selected according to the socio-economic groups of low, middle and high income and 11 commercial establishments according to business activities.

Each house was assigned a number and issued eight (8) garbage bags each, one garbage bag for each day and the waste generated was collected everyday between 10-12am for eight (8) consecutive days to allow for variation in waste generation over the week. The numbers of people in each household were recorded in order to estimate the unit generation rates.

The following procedure was followed

1. The 25 garbage bags were weighed and noted under designated number
2. From the 25 bags, six (6) bags were randomly selected; one quarter of the total selected and the contents were emptied into the bucket.
3. The contents of the bucket were spread on a plastic sheet and repeated until all the contents of the six (6) bags were emptied. The number of bucketful loads was noted for volume determination
4. Waste constituents were separated into fifteen (15) different components and each category was weighed on scale and weight was recorded.

5. All the wastes were properly dumped and equipment cleaned or disposed.
6. The samples collected on the first day were disregarded as it is not sure whether the waste collected on the first day represented one day's waste or more.

Hence steps 1-5 were repeated everyday for the duration of the study.

8. Results

Following table highlights the data analysis for the following:

1. **Mean Bulk Density**
2. **Mean Daily Generation (Domestic)**
3. **Percentage (by weight) of waste streams**

8.1 Domestic Waste

(Some sentences to explain the table, please.)

| Domestic Waste type | Daily Generation Rate | Daily Total Volume | Mean Bulk Density |
|----------------------------|------------------------------|---------------------------|-------------------------------|
| Low Income | 0.49 kg/person/day | 1032.5 L | 101 kg/m ³ |
| Middle Income | 0.37 kg/person/day | 1020 L | 86.5 kg/m ³ |
| High Income | 0.57 kg/person/day | 1070 L | 101 kg/m ³ |
| Total mean | 0.47 kg/person/day | 1040.83 L | 96.16 kg/m³ |

8.2 Commercial Waste

(Some sentences to explain the table figures)

| Daily Generation Rate | Daily Total Volume | Mean Bulk Density |
|------------------------------|---------------------------|--------------------------|
| 0.09 kg/m ² /day | 5732.5 L | 0.07 kg/L |

8.3 Detailed Results

Table showing Data Sheet for Daily Generation Rate for Low Income Households

| House No.* | Family size** | Days | | | | | | | |
|------------|---------------|------|------|------|------|------|------|------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
| 1 | 7 | 4.9 | 10.4 | 9.2 | 11.2 | 2.1 | 10.8 | 11 | 59.6 |
| 2 | 6 | 17.2 | 7.4 | 0 | 19.5 | 5.4 | 5.7 | 1.4 | 56.6 |
| 3 | 7 | 9.4 | 7.4 | 6.5 | 5.8 | 0.1 | 1.9 | 1.9 | 33 |
| 4 | 10 | 16.9 | 4.2 | 2.3 | 7.1 | 9.1 | 2.8 | 3.5 | 45.9 |
| 5 | 3 | 4.3 | 17.9 | 0.6 | 0.1 | 0.7 | 0 | 0 | 23.6 |
| 6 | 7 | 2.2 | 2.4 | 2.2 | 7.3 | 5.9 | 2.1 | 5 | 27.1 |
| 7 | 10 | 2.3 | 3.2 | 0.1 | 2.3 | 3.1 | 1.6 | 0.4 | 13 |
| 8 | 9 | 3.2 | 4.5 | 2.5 | 0 | 0.9 | 2.3 | 0.3 | 13.7 |
| 9 | 6 | 2.9 | 2.5 | 2.5 | 1.7 | 5.7 | 3.7 | 3.5 | 22.5 |
| 10 | 3 | 9.5 | 0 | 5 | 3.1 | 0 | 0 | 0 | 17.6 |
| 11 | 9 | 5 | 0.2 | 1.7 | 0.6 | 0.8 | 0.2 | 0.4 | 8.9 |
| 12 | 5 | 2.3 | 2.1 | 3.5 | 0.1 | 0.3 | 7.3 | 6.4 | 22 |
| 13 | 10 | 1.1 | 2.2 | 0.5 | 4.3 | 0.7 | 10.9 | 0 | 19.7 |
| 14 | 17 | 1.9 | 1 | 16.2 | 8.9 | 2.5 | 4.4 | 4.8 | 39.7 |
| 15 | 5 | 6.4 | 1.9 | 0 | 0 | 0.5 | 0 | 0 | 8.8 |
| 16 | 10 | 8.4 | 3.1 | 3.4 | 3 | 2.7 | 0.7 | 2.8 | 24.1 |
| 17 | 6 | 4.3 | 2.4 | 0.1 | 4.5 | 0.3 | 3.9 | 1.6 | 17.1 |
| 18 | 12 | 4.1 | 5.2 | 5.4 | 2.1 | 0 | 2.3 | 0.7 | 19.8 |
| 19 | 11 | 2.4 | 2.3 | 1.4 | 1 | 8.5 | 1.8 | 0 | 17.4 |
| 20 | 10 | 14.6 | 11.5 | 2.1 | 8.1 | 2.9 | 2.6 | 2.9 | 44.7 |
| 21 | 5 | 0 | 0.9 | 0.9 | 2.3 | 0 | 2.4 | 0.1 | 6.6 |
| 22 | 7 | 8.8 | 12.8 | 7.7 | 7.7 | 11.1 | 9.2 | 15.3 | 72.6 |
| 23 | 8 | 3.9 | 12 | 5.9 | 5 | 2.5 | 0 | 1 | 30.3 |
| 24 | 8 | 1.7 | 3.6 | 0.4 | 4.3 | 1.7 | 1.2 | 2.4 | 15.3 |
| 25 | 4 | 1.9 | 0.4 | 0 | 0.3 | 0.6 | 1.8 | 1.2 | 6.2 |
| | | | | | | | | | |
| Total | 195 | | | | | | | | 665.8 |

(Please add sentences here to introduce this table.)

| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|------------------------|-------|-------|--------|-------|-------|-------|-------|--------|
| No. of bucketful loads | 5 1/2 | 8 3/4 | 9 3/4 | 9 7/8 | 6 | 5 3/4 | 6 | 51 5/8 |
| Daily total | 110.0 | 175.0 | 195.00 | 197.5 | 120.0 | 115.0 | 120.0 | 1032.5 |

| | | | | | | | | |
|------------|---|---|--|---|---|---|---|---|
| volum e | 0 | 0 | | 0 | 0 | 0 | 0 | 0 |
|------------|---|---|--|---|---|---|---|---|

(Please add sentences here to introduce this table.)

| Day 1 | | Day 2 | | Day 3 | | Day 4 | | Day 5 | | Day 6 | | Day 7 | |
|--------------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|------------|
| H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt |
| 6 | 2.2 | 7 | 2.2 | 1 | 9.2 | 9 | 1.7 | 7 | 3.1 | 3 | 1.9 | 2 | 1.4 |
| 13 | 1.1 | 9 | 12 | 5 | 0.6 | 10 | 3.1 | 8 | 0.9 | 6 | 2.1 | 3 | 1.9 |
| 14 | 1.9 | 11 | 0.2 | 7 | 0.1 | 16 | 3 | 11 | 0.8 | 7 | 1.6 | 7 | 0.4 |
| 23 | 3.9 | 13 | 1 | 12 | 3.5 | 20 | 8.1 | 19 | 8.5 | 8 | 2.3 | 11 | 0.4 |
| 24 | 1.7 | 14 | 0.4 | 19 | 1.4 | 21 | 2.3 | 23 | 2.5 | 19 | 1.8 | 23 | 1 |
| 25 | 1.9 | 19 | 3.6 | 20 | 2.1 | 25 | 1 | 24 | 1.7 | 20 | 2.6 | 25 | 1.2 |
| | | | | | | | | | | | | | |
| Total | 12.7 | | 19.4 | | 16.9 | | 19.2 | | 17.5 | | 12.3 | | 6.3 |

Table showing Low Income Households Composition of generated waste

| Category | DAYS | | | | | | | Weight | |
|---------------------------|------|-----|-----|-----|-----|-----|-----|--------------|--------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | kg | % |
| Vegetable/ putrescible | 5 | 2.8 | 2.4 | 7.4 | 3.1 | 4.4 | 2.9 | 28 | 19.4% |
| Bones | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% |
| Betelnut | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2.8% |
| Grass/leaves woods | 1.5 | 2.2 | 1.6 | 1.3 | 1.7 | 2.4 | 0 | 10.7 | 7.4% |
| Cardboards | 0 | 0 | 1.6 | 0 | 0 | 0 | 0 | 1.6 | 1.1% |
| Tetra packs | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% |
| Other papers | 2.2 | 1.7 | 2.1 | 3.5 | 1.5 | 2.6 | 1.5 | 15.1 | 10.4% |
| Textiles | 0 | 0.9 | 2.7 | 2.7 | 1.5 | 1.5 | 0 | 9.3 | 6.4% |
| PETT bottles | 0 | 1.2 | 1.5 | 1.2 | 1 | 1.1 | 1.1 | 7.1 | 4.9% |
| Other plastics | 1.5 | 4.1 | 3 | 2.7 | 3.4 | 2.9 | 2 | 19.6 | 13.6% |
| Leather/rubber | 1.1 | 1.8 | 0 | 1.3 | 1.2 | 0 | 1.8 | 7.2 | 5.0% |
| Aluminum cans | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% |
| Other metals | 2.1 | 1.6 | 2.7 | 1.8 | 1.3 | 3.1 | 1 | 13.6 | 9.4% |
| Glass/ceramics | 1.4 | 0.1 | 6.4 | 1.1 | 0 | 0.2 | 1.1 | 10.3 | 7.1% |
| Hazardous waste | 0 | 0 | 0 | 2.5 | 1.8 | 0.9 | 1.3 | 6.5 | 4.5% |
| Miscellaneous | 5 | 2.2 | 2.6 | 1.7 | 0 | 0 | 0 | 11.5 | 8.0% |
| | | | | | | | | | |
| Total | | | | | | | | 144.5 | 100 |

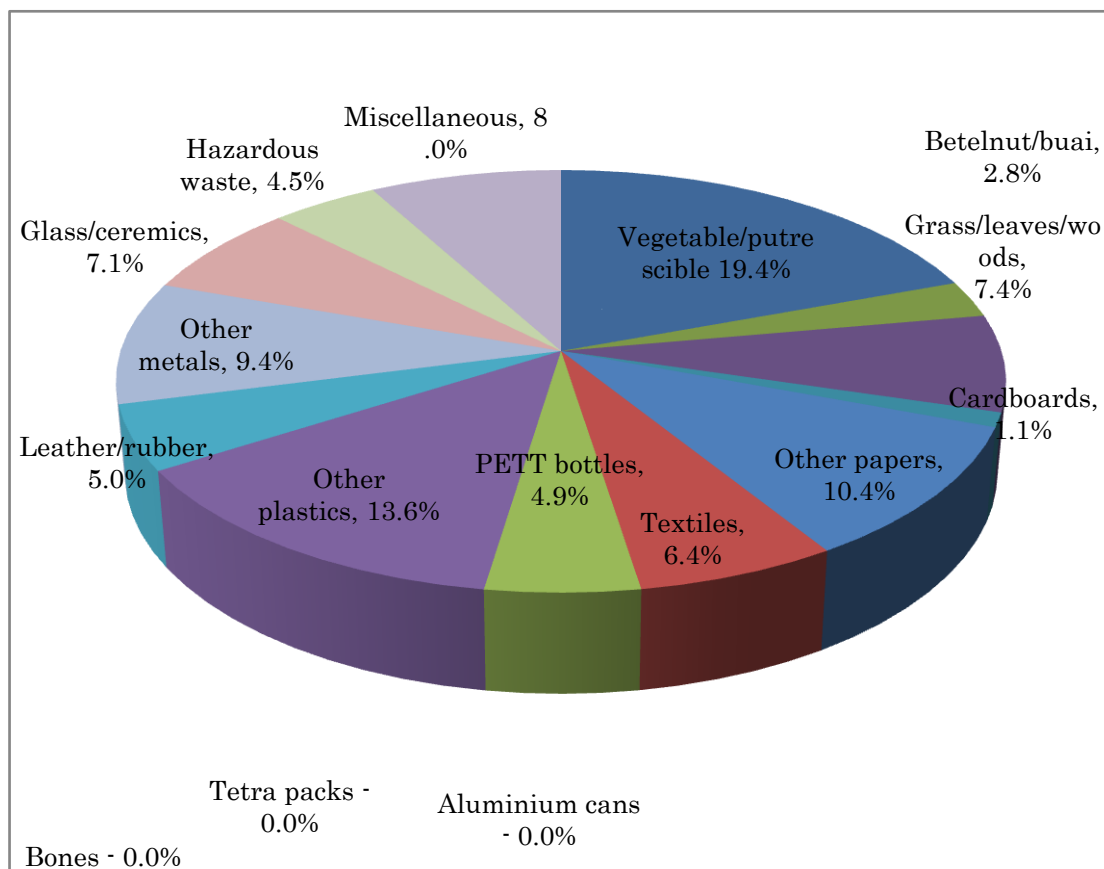


Table showing Data Sheet for Daily Generation Rate for Middle Income Households

| House No.* | Family size** | Days | | | | | | | Total |
|------------|---------------|------|------|-----|-----|-----|-----|-----|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 1 | 3 | 0.2 | 0.8 | 0.7 | 4.8 | 0.9 | 0 | 1.7 | 9.1 |
| 2 | 6 | 1.7 | 4.2 | 2.2 | 4.6 | 0 | 0 | 0.4 | 13.1 |
| 3 | 9 | 2.2 | 2 | 3.6 | 5.4 | 3.5 | 1 | 1.4 | 19.1 |
| 4 | 7 | 1.5 | 2 | 3.3 | 3.3 | 1.1 | 1.6 | 1.7 | 14.5 |
| 5 | 7 | 1.1 | 2.9 | 1.2 | 2 | 1.5 | 1.7 | 2.2 | 12.6 |
| 6 | 8 | 2.7 | 4 | 6.4 | 2.3 | 2.8 | 5.8 | 2.7 | 26.7 |
| 7 | 7 | 2.2 | 2.7 | 2.6 | 2.7 | 2.7 | 1.6 | 3.4 | 17.9 |
| 8 | 8 | 4.4 | 3.8 | 2 | 5.7 | 1.2 | 2.4 | 1.8 | 21.3 |
| 9 | 7 | 0.4 | 0.7 | 1.1 | 0.5 | 0.7 | 0.5 | 1.2 | 5.1 |
| 10 | 10 | 6.9 | 3.6 | 4 | 3.8 | 7.2 | 5.6 | 2.1 | 33.2 |
| 11 | 3 | 2.8 | 1.9 | 2.6 | 2 | 1.1 | 3.8 | 2 | 16.2 |
| 12 | 13 | 5.3 | 5.2 | 4.5 | 7.1 | 3.8 | 4.5 | 7.1 | 37.5 |
| 13 | 9 | 9 | 10.8 | 8.6 | 3.7 | 8.1 | 4.6 | 4.9 | 49.7 |
| 14 | 9 | 0 | 2.6 | 4.5 | 1.5 | 1.3 | 8.2 | 7 | 25.1 |
| 15 | 8 | 3.1 | 21.4 | 7.6 | 1.7 | 3.6 | 6 | 2.2 | 45.6 |
| 16 | 9 | 1 | 2.3 | 0.3 | 1 | 3.1 | 4.8 | 1.6 | 14.1 |
| 17 | 12 | 6.4 | 1.9 | 3 | 2 | 9.9 | 6 | 5.4 | 34.6 |
| 18 | 8 | 3.1 | 1.5 | 5 | 1.9 | 3.1 | 1.6 | 2.4 | 18.6 |
| 19 | 10 | 1.3 | 2.9 | 1.9 | 2.6 | 3 | 2.3 | 2.4 | 16.4 |
| 20 | 12 | 2 | 1.7 | 2.1 | 1 | 3.8 | 1.9 | 2.4 | 14.9 |
| 21 | 6 | 5.8 | 1.6 | 3 | 2.2 | 2.9 | 2.5 | 3 | 21 |
| 22 | 8 | 2.5 | 1 | 1.6 | 0.5 | 0.9 | 1.5 | 2.4 | 10.4 |
| 23 | 12 | 4 | 2.4 | 3.4 | 1.4 | 2.2 | 6.1 | 2 | 21.5 |
| 24 | 4 | 4.2 | 3.3 | 0 | 1.7 | 1.8 | 0.8 | 0.6 | 12.4 |
| 25 | 9 | 1.3 | 0.4 | 3.1 | 2.4 | 1.5 | 2 | 0.9 | 11.6 |

| | | | | | | | | | |
|--------------|------------|--|--|--|--|--|--|--|--------------|
| | | | | | | | | | |
| Total | 204 | | | | | | | | 522.2 |

(Please add sentences here to introduce this table.)

| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|------------------------|----------|----------|----------|----------|----------|----------|----------|--------------|
| No. of bucketful loads | 8 | 4 1/4 | 7 1/2 | 7 1/2 | 8 1/4 | 6 1/2 | 9 | 51 |
| Daily total volume | 160.00 | 85.00 | 150.00 | 150.00 | 165.00 | 130.00 | 180.00 | 1020.00 |

(Please add sentences here to introduce this table.)

| Day 1 | | Day 2 | | Day 3 | | Day 4 | | Day 5 | | Day 6 | | Day 7 | |
|--------------|-------------|--------------|------------|--------------|-----------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-----------|
| H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt |
| 5 | 1.1 | 3 | 2 | 3 | 3.6 | 4 | 3.3 | 1 | 0.9 | 4 | 1.6 | 1 | 1.7 |
| 11 | 2.8 | 4 | 2 | 5 | 1.2 | 6 | 2.3 | 8 | 1.2 | 7 | 1.6 | 8 | 1.8 |
| 16 | 1 | 17 | 1.9 | 9 | 1.1 | 7 | 2.7 | 9 | 0.7 | 10 | 5.6 | 9 | 1.2 |
| 20 | 2 | 18 | 1.5 | 17 | 3 | 11 | 2 | 16 | 3.1 | 18 | 1.6 | 16 | 1.5 |
| 22 | 2.5 | 21 | 1.6 | 22 | 1.6 | 17 | 2 | 20 | 3.8 | 24 | 0.8 | 17 | 5.4 |
| 24 | 4.2 | 25 | 0.4 | 24 | 1.5 | 18 | 1.9 | 22 | 2.2 | 25 | 2 | 20 | 2.4 |
| | | | | | | | | | | | | | |
| Total | 13.6 | | 9.4 | | 12 | | 14.2 | | 11.9 | | 13.2 | | 14 |

(Please add sentences here to introduce this table.)

| Category | Days | | | | | | | Total Weight | % |
|-----------------------|-------------|----------|----------|----------|----------|----------|----------|---------------------|---------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| Vegetable/putrescible | 3.2 | 2.6 | 4.5 | 5.7 | 4.8 | 6.5 | 6.3 | 33.6 | 37.0% |
| Bones | 0 | 0 | 0.2 | 0.1 | 0 | 0 | 0.1 | 0.4 | 0.4% |
| Betelnut/buai | 0 | 0.9 | 0.7 | 0.6 | 0 | 1 | 0.2 | 3.4 | 3.7% |
| Grass/leaves/woods | 4.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 4.2 | 4.6% |
| Cardboards | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0.1 | 0.1% |
| Tetra packs | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0 | 1.1 | 1.2% |
| Other papers | 0 | 2.3 | 2.3 | 4 | 2.1 | 4 | 4.5 | 19.2 | 21.3% |
| Textiles | 0 | 0.1 | 0.1 | 0.7 | 0.6 | 0 | 0.1 | 1.6 | 1.8% |
| PETT bottles | 0.2 | 0 | 0.1 | 0.2 | 0 | 0 | 0.8 | 1.3 | 1.4% |
| Other plastics | 0.9 | 0.9 | 2.3 | 2 | 1.5 | 1.8 | 0.3 | 9.7 | 10.7% |
| Leather/rubber | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1% |
| Aluminium | 7.2 | 0.4 | 0 | 0 | 1 | 0 | 1.1 | 9.7 | 10.7% |
| Other metals | 0 | 0 | 1 | 0.7 | 0 | 0.4 | 0 | 2.1 | 2.3% |
| Glass/ceramics | 0.2 | 0.3 | 0.3 | 0 | 0 | 0.1 | 0.1 | 1 | 1.1% |
| Hazardous waste | 0.2 | 0 | 0.1 | 0.1 | 0 | 0 | 0 | 0.4 | 0.4% |
| Miscellaneous | 0 | 0 | 0 | 0 | 1.9 | 0 | 1 | 2.9 | 3.2% |
| | | | | | | | | | |
| Total | | | | | | | | 90.8 | 100.0% |

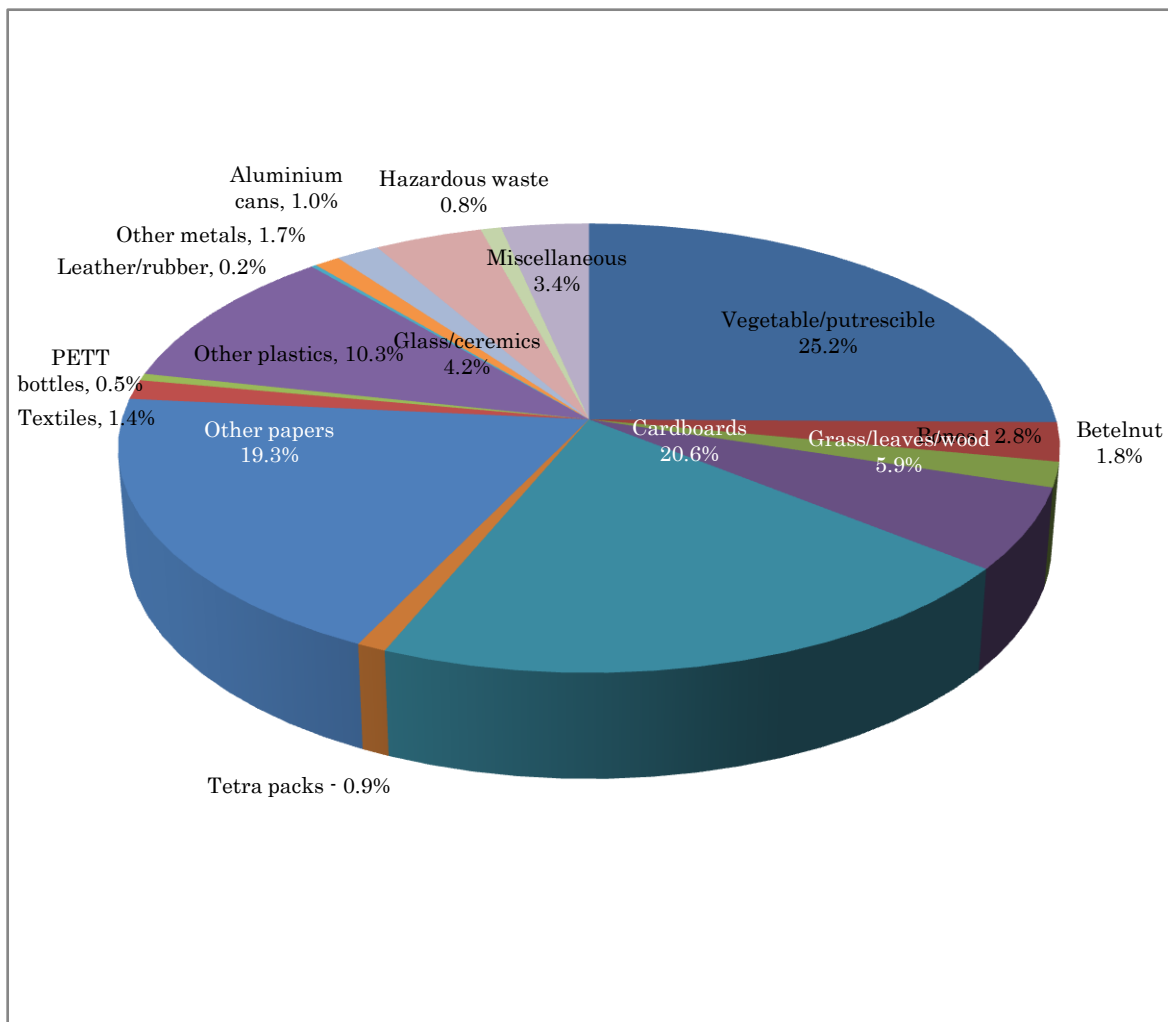


Table showing Data Sheet for Daily Generation Rate for High Income Households

| House No.* | Family size** | Days | | | | | | | Total |
|------------|---------------|------|-----|------|-----|-----|-----|-----|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| 1 | 3 | 0 | 2.9 | 0.6 | 2.6 | 0.4 | 5 | 3.2 | 14.7 |
| 2 | 5 | 2.6 | 1 | 3.4 | 2.5 | 2.7 | 2.4 | 2 | 16.6 |
| 3 | 4 | 1.1 | 5.1 | 1.5 | 1.5 | 1.9 | 4 | 3 | 18.1 |
| 4 | 8 | 4.3 | 3.3 | 5.9 | 3.3 | 2.8 | 1.1 | 3 | 23.7 |
| 5 | 3 | 0.9 | 0.5 | 0.8 | 0.4 | 0.5 | 1 | 1.2 | 5.3 |
| 6 | 4 | 1.7 | 3.8 | 0.6 | 0.7 | 1.1 | 0.9 | 3.3 | 12.1 |
| 7 | 5 | 10.5 | 9 | 2 | 3.1 | 3.5 | 6.9 | 4.6 | 39.6 |
| 8 | 4 | 1.6 | 0.8 | 1.7 | 0.5 | 1.9 | 1.1 | 4 | 11.6 |
| 9 | 14 | 4.1 | 2.1 | 1.9 | 2.6 | 0.4 | 2.7 | 2.2 | 16 |
| 10 | 1 | 1.8 | 0.4 | 2.2 | 0.2 | 4.4 | 0 | 1.9 | 10.9 |
| 11 | 6 | 8.5 | 4.2 | 5.8 | 2.9 | 5.7 | 9.5 | 1.7 | 38.3 |
| 12 | 8 | 0.4 | 3.1 | 12.9 | 4.9 | 8.7 | 5.3 | 8.1 | 43.4 |
| 13 | 3 | 8.5 | 5.4 | 3.7 | 0.5 | 5.7 | 2.7 | 8.6 | 35.1 |
| 14 | 5 | 0.4 | 5 | 3.8 | 2.1 | 3.7 | 3.3 | 3 | 21.3 |
| 15 | 3 | 1.1 | 1 | 0.4 | 1.9 | 3.5 | 3.5 | 3.1 | 14.5 |
| 16 | 3 | 1.3 | 2.3 | 0.5 | 1.7 | 0.5 | 1 | 2.5 | 9.8 |
| 17 | 6 | 2.9 | 3 | 2.2 | 1.8 | 5.8 | 5.5 | 5.3 | 26.5 |
| 18 | 4 | 3.8 | 1.8 | 1.7 | 0.8 | 3.9 | 3 | 2.6 | 17.6 |
| 19 | 4 | 1.6 | 2.2 | 2.5 | 2 | 1.5 | 0.8 | 1 | 11.6 |
| 20 | 1 | 1.8 | 2.7 | 4.6 | 0 | 2.1 | 1.8 | 1.1 | 14.1 |
| | | | | | | | | | |

| | | | | | | | | | |
|--------------|-----------|--|--|--|--|--|--|--|--------------|
| Total | 94 | | | | | | | | 400.8 |
|--------------|-----------|--|--|--|--|--|--|--|--------------|

(Please add sentences here to introduce this table.)

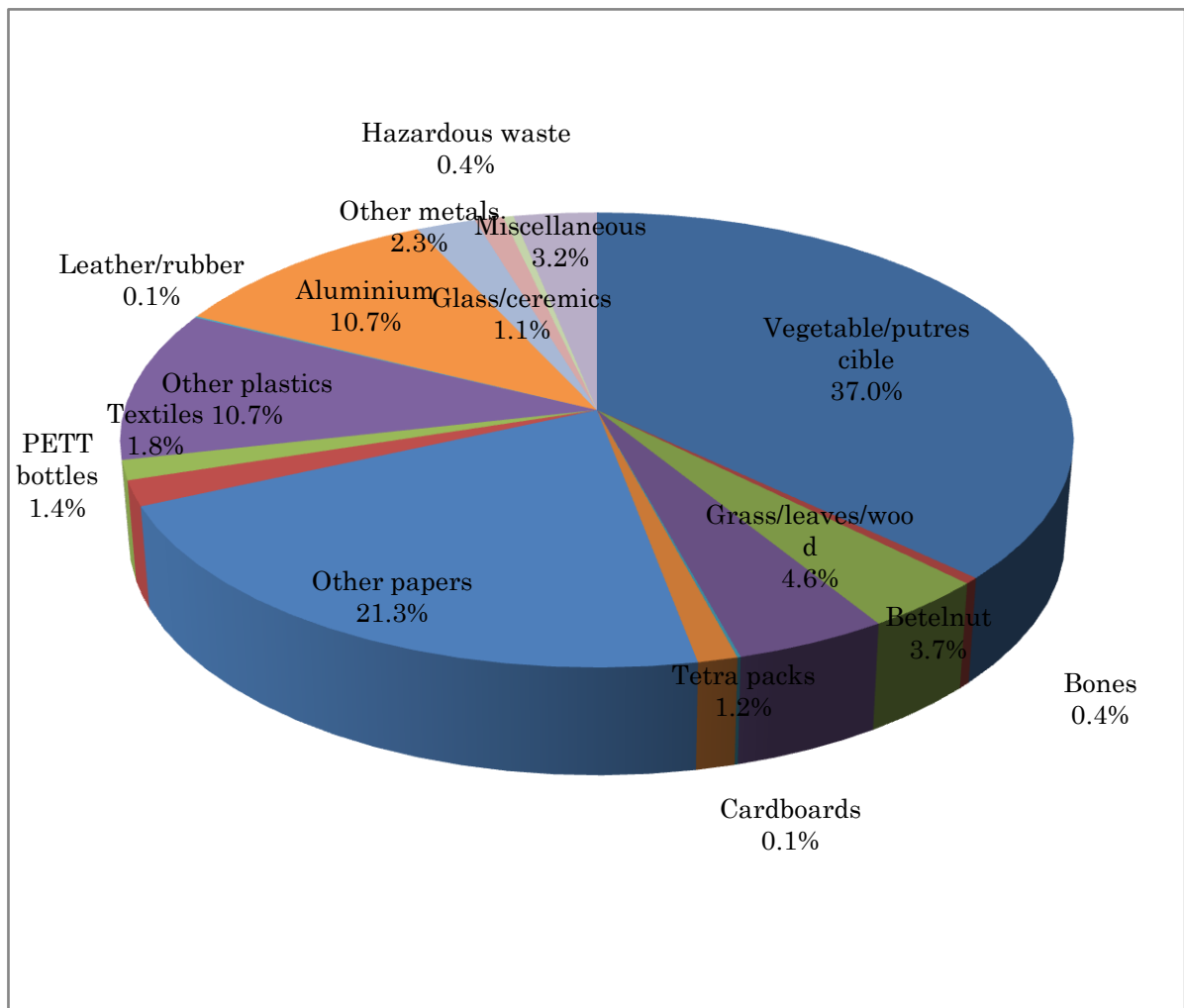
| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|------------------------|----------|----------|----------|----------|----------|----------|----------|--------------|
| No. of bucketful loads | 8 | 8 3/4 | 10 | 5 3/4 | 6 | 6 | 9 | 53 1/2 |
| Daily total volume | 160.00 | 175.00 | 200.00 | 115.00 | 120.00 | 120.00 | 180.00 | 1070.00 |

| Day 1 | | Day 2 | | Day 3 | | Day 4 | | Day 5 | | Day 6 | | Day 7 | |
|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|--------------|-------------|
| H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt | H # | Wt |
| 4 | 4.3 | 4 | 3.3 | 4 | 5.9 | 4 | 3.3 | 4 | 2.4 | 4 | 1.1 | 1 | 3.2 |
| 15 | 1.1 | 12 | 3.1 | 7 | 2 | 9 | 2.6 | 6 | 1.1 | 9 | 2.7 | 2 | 2 |
| 17 | 2.9 | 16 | 2.3 | 14 | 3.8 | 12 | 4.9 | 14 | 3.7 | 14 | 3.3 | 6 | 3.3 |
| 18 | 3.8 | 17 | 3 | 19 | 2.5 | 14 | 2.1 | 18 | 1.9 | 18 | 3.9 | 9 | 2.2 |
| 20 | 1.8 | 18 | 1.8 | 20 | 2.7 | 19 | 2 | 20 | 2.1 | 19 | 0.8 | 18 | 2.6 |
| | | | | | | | | | | | | | |
| Total | 13.9 | | 13.5 | | 16.9 | | 14.9 | | 11.2 | | 11.8 | | 13.3 |

(Please add sentences here to introduce this table.)

Table showing High Income Earners Composition of generated waste

| Category | DAYS | | | | | | | Weight | % |
|-----------------------|-------------|----------|----------|----------|----------|----------|----------|---------------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| Vegetable/putrescible | 3.2 | 2.6 | 4.5 | 5.7 | 4.8 | 6.5 | 6.3 | 33.6 | 37.0% |
| Bones | 0 | 0 | 0.2 | 0.1 | 0 | 0 | 0.1 | 0.4 | 0.4% |
| Betelnut | 0 | 0.9 | 0.7 | 0.6 | 0 | 1 | 0.2 | 3.4 | 3.7% |
| Grass/leaves woods | 4.1 | 0.1 | 0 | 0 | 0 | 0 | 0 | 4.2 | 4.6% |
| Cardboards | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0.1 | 0.1% |
| Tetra packs | 0.2 | 0.2 | 0.1 | 0.2 | 0.2 | 0.2 | 0 | 1.1 | 1.2% |
| Other papers | 0 | 2.3 | 2.3 | 4 | 2.1 | 4 | 4.5 | 19.2 | 21.1% |
| Textiles | 0 | 0.1 | 0.1 | 0.7 | 0.6 | 0 | 0.1 | 1.6 | 1.8% |
| PETT bottles | 0.2 | 0 | 0.1 | 0.2 | 0 | 0 | 0.8 | 1.3 | 1.4% |
| Other plastics | 0.9 | 0.9 | 2.3 | 2 | 1.5 | 1.8 | 0.3 | 9.7 | 10.7% |
| Leather/rubber | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1% |
| Aluminium cans | 7.2 | 0.4 | 0 | 0 | 1 | 0 | 1.1 | 9.7 | 10.7% |
| Other metals | 0 | 0 | 1 | 0.7 | 0 | 0.4 | 0 | 2.1 | 2.3% |
| Glass/ceremics | 0.2 | 0.3 | 0.3 | 0 | 0 | 0.1 | 0.1 | 1 | 1.1% |
| Hazardous waste | 0.2 | 0 | 0.1 | 0.1 | 0 | 0 | 0 | 0.4 | 0.4% |
| Miscellaneous | 0 | 0 | 0 | 0 | 1.9 | 0 | 1 | 2.9 | 3.2% |
| Total | | | | | | | | | |



(Please add sentences here to introduce this table.)

Tables showing data results Commercial Waste study

| Bussines Name/Type | Floor Area (m ²) | Days | | | | | | | Total |
|---------------------|------------------------------|------|------|-------|------|------|------|------|--------------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| Office | | | | | | | | | |
| 1.Lagatoi Haus | 122 | 21.7 | 0 | 17.8 | 13.5 | 6.6 | 2.9 | 0 | 62.5 |
| 2.Maybank | 100 | 3.6 | 0 | 9.7 | 4.7 | 0 | 5 | 3 | 26 |
| | 222 | | | | | | | | 88.5 |
| Retail Shops | | | | | | | | | |
| 1.Jasamire | 139 | 9.7 | 21.7 | 15 | 5.4 | 11.1 | 4.4 | 7.8 | 75.1 |
| 2.Able Comp | 29 | 5.4 | 4.8 | 12 | 4.7 | 15.4 | 6.7 | 11.4 | 60.4 |
| | 168 | | | | | | | | 135.5 |
| Fast Food | | | | | | | | | |
| 1.Kenmaity | 160 | 54.1 | 22.9 | 10.8 | 3.5 | 13.9 | 10.3 | 16.9 | 132.4 |
| 2.Lot 1 Kaibar | 147 | 17.1 | 15.6 | 9.2 | 13.5 | 15.9 | 8.2 | 11.9 | 91.4 |
| | 307 | | | | | | | | 223.8 |
| Restaurant | | | | | | | | | |
| 1.Jepello | 127 | 36.8 | 0 | 31.8 | 23.7 | 39.3 | 34.2 | 32.4 | 198.2 |
| Wholesale | | | | | | | | | |
| 1.TE PNG | 650 | 28.1 | 10.2 | 12.7 | 25.9 | 17.7 | 14.6 | 9.6 | 118.8 |
| 2.Zenag | 250 | 26.5 | 8.7 | 105.7 | 60.5 | 21.7 | 24.4 | 77.7 | 325.2 |
| | 900 | | | | | | | | 444 |

| Hotel | | | | | | | | | |
|------------------|-------------|------|------|------|------|-----|------|------|-------------|
| 1.Shady Rest | 550 | 56.5 | 95.6 | 41.9 | 23.1 | 73 | 89.2 | 54.5 | 433.8 |
| 2.Raintree Lodge | 220 | 20.8 | 14.7 | 4.9 | 14.5 | 4.9 | 2.6 | 14.8 | 77.2 |
| | 770 | | | | | | | | 511 |
| | | | | | | | | | |
| Total | 2494 | | | | | | | | 1601 |

(Please add sentences here to introduce this table.)

| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|------------------------|----------|----------|----------|----------|----------|----------|----------|----------------|
| No. of bucketful loads | 53 | 30 1/8 | 57 | 43 5/8 | 38 1/2 | 28 5/8 | 35 3/4 | 286 5/8 |
| Daily total volume | 1060.00 | 602.50 | 1140.00 | 872.50 | 770.00 | 572.50 | 715.00 | 5732.50 |

(Please add sentences here to introduce this table.)

| Day | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Total |
|-------------------|----------|----------|----------|----------|----------|----------|----------|--------------|
| 1/4 Weight | 70 | 48.6 | 67.9 | 48.3 | 54.9 | 50.6 | 60 | 400.3 |

(Please explain how you would be able to estimate the total amount of generated commercial waste)?

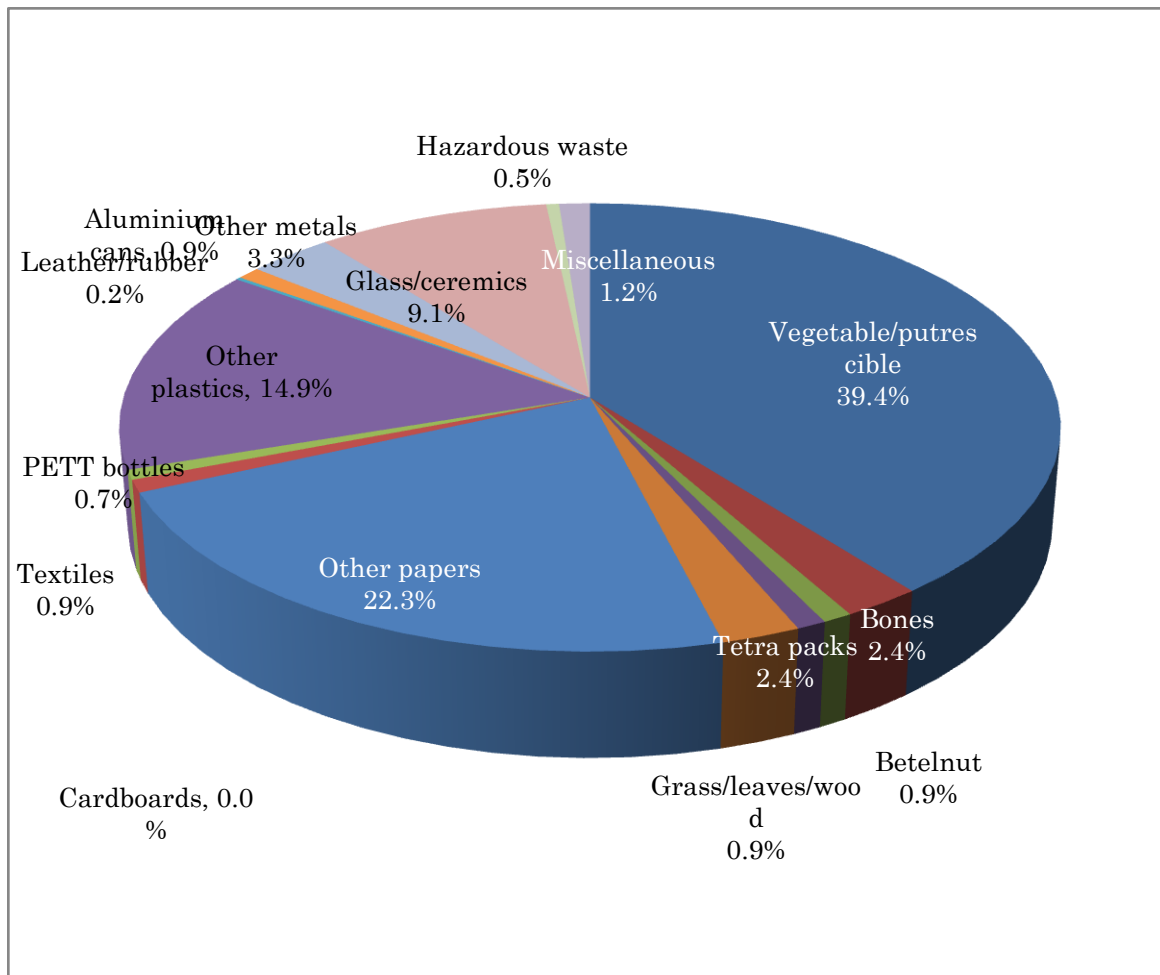
(Please add sentences here to introduce this table.)

Table showing Commercial Waste Composition of generated waste

| Category | DAYS | | | | | | | Weight | % |
|-----------------------|-------------|----------|----------|----------|----------|----------|----------|---------------|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |
| Vegetable/putrescible | 7.4 | 7 | 6.5 | 8 | 3.8 | 4.3 | 2.8 | 39.8 | 39.4% |
| Bones | 0.6 | 0 | 0.2 | 0.3 | 0.5 | 0.4 | 0.4 | 2.4 | 2.4% |
| Betelnut | 0.4 | 0 | 0.4 | 0 | 0 | 0.1 | 0 | 0.9 | 0.9% |
| Grass/leaves woods | 0.2 | 0 | 0.2 | 0 | 0 | 0.2 | 0.4 | 1 | 0.9% |
| Cardboards | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% |
| Tetra packs | 0.3 | 0.4 | 0.4 | 0.2 | 0 | 0.8 | 0.3 | 2.4 | 2.4% |
| Other papers | 3.1 | 3.1 | 4 | 3.1 | 3.2 | 2.6 | 3.4 | 22.5 | 22.3% |
| Textiles | 0 | 0 | 0.1 | 0.2 | 0.5 | 0.1 | 0.1 | 1 | 0.9% |
| PETT bottles | 0.1 | 0 | 0.5 | 0 | 0 | 0 | 0.1 | 0.7 | 0.7% |
| Other plastics | 0 | 2 | 2.9 | 1.7 | 2.1 | 1.9 | 4.4 | 15 | 14.9% |
| Leather/rubber | 0 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0.2 | 0.2% |
| Aluminium cans | 0 | 0 | 0.4 | 0.1 | 0 | 0.2 | 0.2 | 0.9 | 0.9% |
| Other metals | 1.1 | 0.3 | 0.4 | 0.6 | 0 | 0.4 | 0.5 | 3.3 | 3.3% |

| | | | | | | | | | |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Glass/ceramics | 0.5 | 0.5 | 4 | 1.3 | 0.4 | 1.9 | 0.6 | 9.2 | 9.1% |
| Hazardous waste | 0.1 | 0.3 | 0.1 | 0 | 0 | 0 | 0 | 0.5 | 0.5% |
| Miscellaneous | 0.2 | 0.8 | 0 | 0 | 0.2 | 0 | 0 | 1.2 | 1.2% |
| Total | | | | | | | | | |

(Please add sentences here to introduce this table.)



9. Conclusions:

- 1) Season of the survey and characteristics of the waste during that season
- 2) Ease of implementing the survey and recommendation on the frequency to implement the survey
- 3) Provide the amount and composition of the total Domestic waste. You can use the population of Port Moresby of 318,128 persons in 2011 National Statistical Office, 2011 Census Preliminary Figures)
- 4) Best way to estimate the amount of the commercial waste
- 5) It would be interesting to compare the final domestic waste composition and amount with similar figures in other Pacific Island Countries. For reference here are some figures for other countries.

Fiji

| Items | Composition | Graphical Presentation |
|-----------------------|---------------|------------------------|
| Kitchen wastes | 59.0% | |
| Paper | 11.2% | |
| Plastics (Films) | 10.1% | |
| Metals ⁽²⁾ | 4.4% | |
| Steel can | 1.4% | |
| Aluminum can | 0.9% | |
| Textiles | 2.6% | |
| Bottles and glass | 2.3% | |
| Pet bottles | 1.7% | |
| Glass and wood | 1.5% | |
| Rubber and leather | 0.4% | |
| Others | 7.0% | |
| TOTAL | 100.0% | |

Source: (1) Waste Amount and Composition Survey in Lautoka City Council and Nadi City Council

(2) To obtain the breakdown of steel and aluminum cans with in the metals component, the results of waste composition survey, Tokyo. 2005 (breakdown of “metals” into steel cans at 32%, and aluminum cans, 20%) were considered.

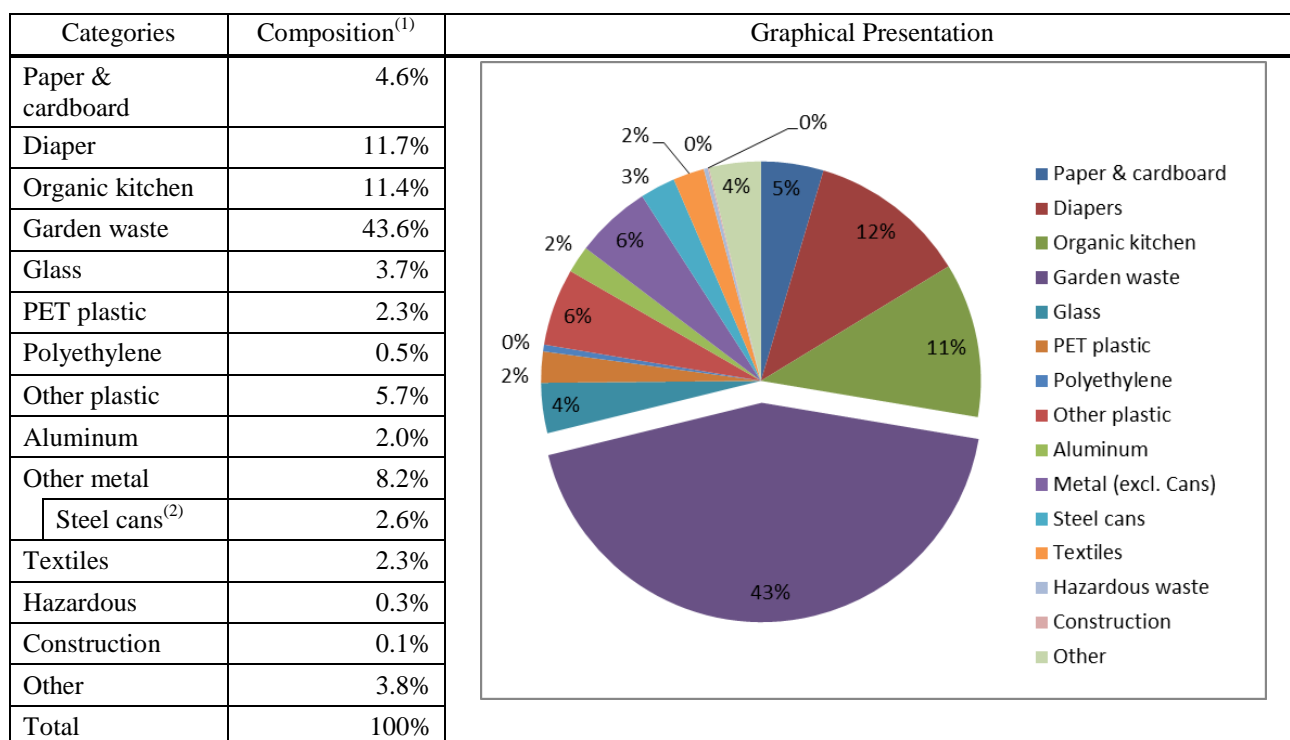
Apia, Samoa

| Categories | Composition ⁽¹⁾ | Graphical Presentation |
|----------------------------|----------------------------|------------------------|
| Green | 38.70% | |
| Food Scrap | 3.80% | |
| Paper | 6.93% | |
| Cardboard | 0.27% | |
| Plastic bags/papers | 6.52% | |
| Plastic bottles/containers | 6.52% | |
| Diapers | 15.08% | |
| Glass | 2.17% | |
| Metals ⁽²⁾ | 8.83% | |
| Steel cans | (2.83%) | |
| Aluminum cans | (1.77%) | |
| Textiles | 6.79% | |
| Others | 4.35% | |
| Total | 100.00% | |

Source: (1) Solid Waste Characterization and Generation Study 2011.VAITELE.

(2) To obtain the breakdown of steel and aluminum cans with in the metals component, the results of waste composition survey, Tokyo. 2005 (breakdown of “metals” into steel cans at 32%, and aluminum cans, 20%) were considered.

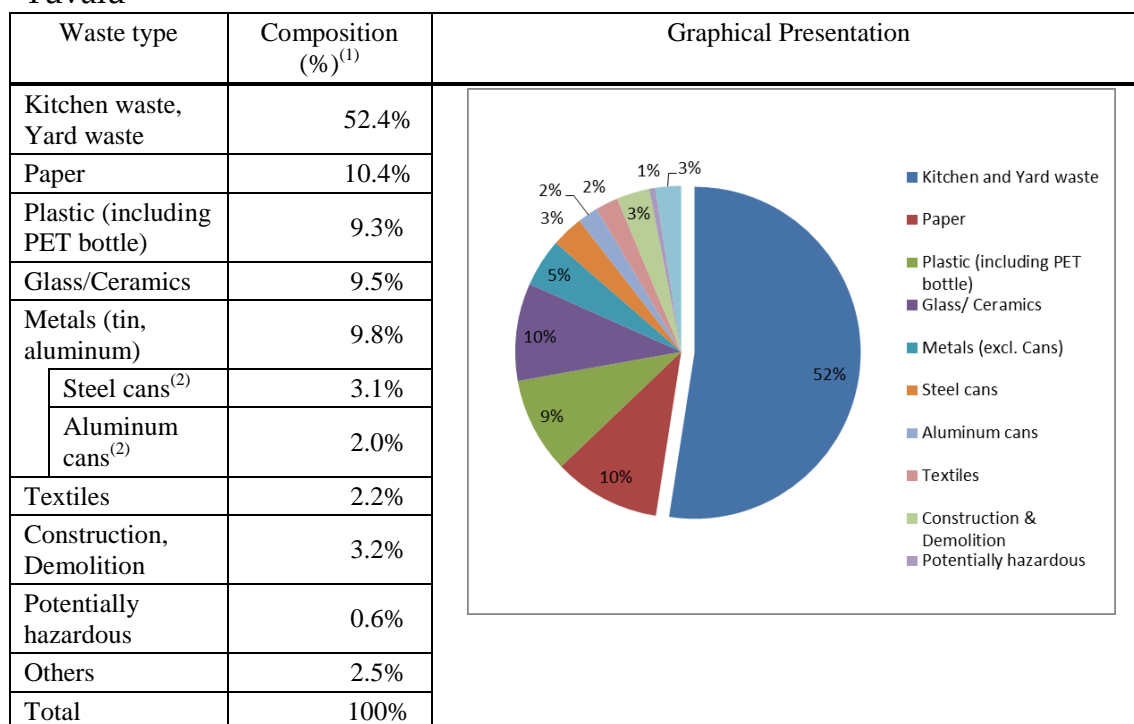
Tonga



Source: (1) Household Economic Survey, June 2005

(2) To obtain the breakdown of steel and aluminum cans with in the metals component, the results of waste composition survey, Tokyo. 2005 (breakdown of “metals” into steel cans at 32%, and aluminum cans, 20%) were considered.

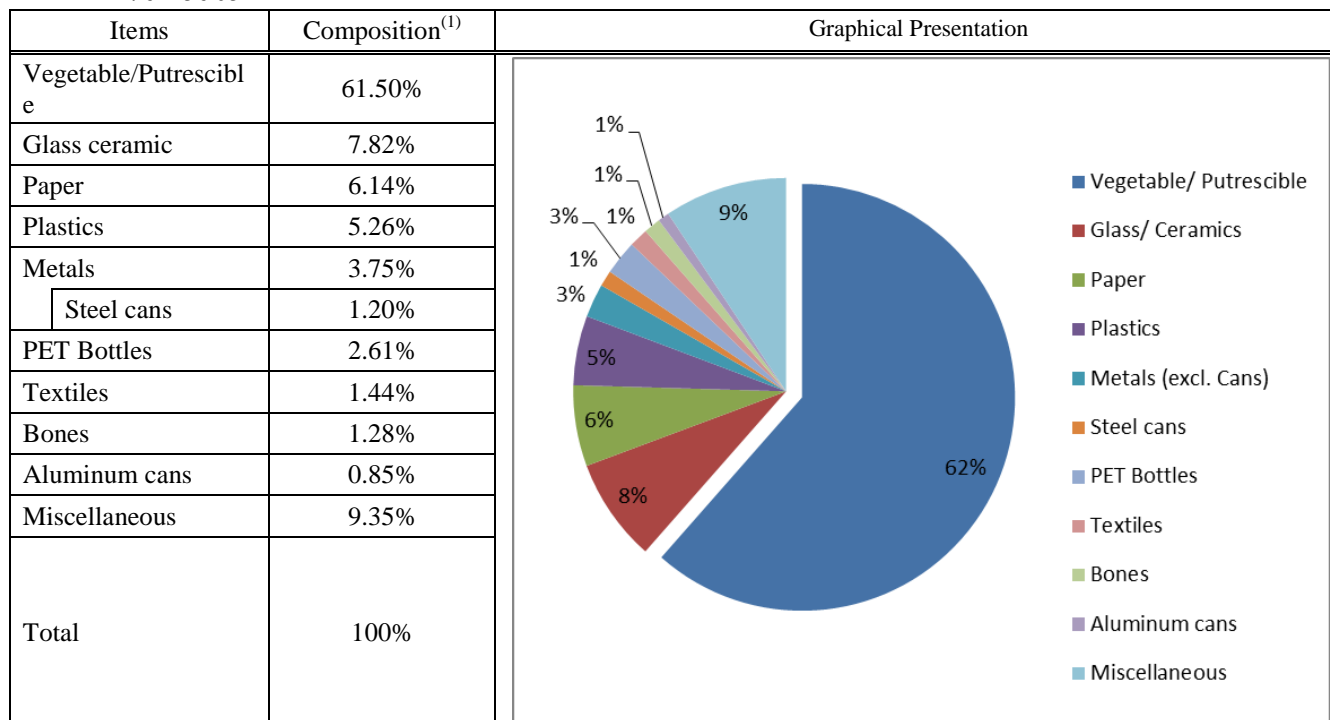
Tuvalu



Source: (1) Source: Solid waste education and awareness in Pacific Island Countries, SPREP 2000

(2) To obtain the breakdown of steel and aluminum cans with in the metals component, the results of waste composition survey, Tokyo. 2005 (breakdown of “metals” into steel cans at 32%, and aluminum cans, 20%) were considered.

Vanuatu



Note: (1) Source: The composition survey in 2011 by Environmental Health Unit in Municipality of Port Vila

(2) To obtain the breakdown of steel and aluminum cans with in the metals component, the results of waste composition survey, Tokyo. 2005 (breakdown of “metals” into steel cans at 32%, and aluminum cans, 20%) were considered.