

# **DOMESTIC WASTE ANALYSIS IN THE CITY OF LILONGWE**

## **PREFACE**

The analysis of domestic wastes generated in the City of Lilongwe was conducted in accordance with the Terms of Reference (Appendix I) issued the Intermediate Technology Consultants Ltd. The consultant was supposed to conduct the analysis in March 1999 but due to heavy persistent rains Malawi experienced in March and April 1999, this was deferred to May 1999.

The samples of domestic wastes analyzed were collected from three different residential areas of the City of Lilongwe

## INTRODUCTION

The City of Lilongwe is the Capital City of the Republic of Malawi and it is centrally located. The population of the city has been increasing rapidly since it became the Capital City of Malawi in 1975. According to statistics obtained from the National Statistical Office, the population of 99,000 in 1977 had increased to 234,000 by 1987 with an annual growth rate of 8.7%. Currently, the population is estimated to be 500,000.

Table VII presents the impact of population growth at 6%, 7%, and 8% per annum. The first percentage represents the urban average population growth rate. The third percentage is a conservative rounding down of the inter 1977-1987 census growth rate for the City of Lilongwe. The middle percentage represents a compromise,

**Table I: Population Projection for the City of Lilongwe up to 2005**

| <b>Year</b> | <b>6% AGR</b> | <b>7% AGR</b> | <b>8% AGR</b> |
|-------------|---------------|---------------|---------------|
| 1987        | 245756        | 245756        | 245756        |
| 1990        | 292699        | 301062        | 309582        |
| 1995        | 391698        | 422255        | 454877        |
| 2000        | 524180        | 592234        | 668364        |
| 2005        | 701471        | 830639        | 982046        |

Source: Integrated Development Strategy

## WASTE MANAGEMENT IN THE CITY OF LILONGWE

The Lilongwe City Council has the overall responsibility for the management of all wastes that are generated within the City's boundaries. The Cleansing Services Department is the one actually responsible for waste collection and disposal.

In the City of Lilongwe wastes are properly managed in areas that are formally planned and developed. These areas include:

- (a) low density residential areas;
- (b) middle density residential areas, and
- (c) high density residential areas.

The income of people is on average high in low density areas and low in high density areas. The type and the amount of wastes generated could be different because of this.

The informal urban wastes which includes over 60% of the urban population have no access to waste management services provided by the Lilongwe City Council.

The wastes that are generated in households are regularly collected in trucks and then disposed of at a designated dump-site which located at Area 38. The wastes are placed in bins by generators and they collected by the council in compactor truck. The compactor trucks are used to collect wastes in low and middle density residential areas while in high density areas skips are used for that purpose. The system of using skips for collecting wastes was introduced in 1996.

There is no sorting or separation of wastes neither at collection points nor at disposal site. At the disposal site separation is crudely done by scavengers who come to pick what is valuable to them.

## ANALYSIS OF WASTES

The analysis was conducted in accordances with the Terms of Reference provided by the Intermediate Technology Consultants Limited. It was conducted on 18th, 19th and 20th May 1999. The analysis could not be done in March or April because of persistent rains. May is when the dry season begins and it was ideal for such analysis.

### Sampling

Three samples each weighing approximately 150 kgs were taken and analyzed. The first sample was taken from a high density residential area (Mchesi), the other from a medium density residential area(Areas 14, 15, & 47), and finally from a low density area (Area 43). The tables below show the results of the anaysis

Table II Domestic Wastes from High Density (Mchesi)

| Type of Waste                   | Weight/ Kg | Percentage % |
|---------------------------------|------------|--------------|
| Food Waste and Vegetable Matter | 31         | 20.0         |
| Paper                           | 3          | 1.9          |
| Cardboard                       | 0          | 0            |
| Plastic film                    | 4.5        | 2.9          |
| Other Plastics                  | 2          | 1.3          |
| Textiles                        | 2          | 1.3          |
| Wood                            | 15         | 9.7          |
| Leather and Rubber              | 0          | 0            |
| Glass                           | 0.5        | 0.3          |
| Metal cans                      | 1          | 0.6          |
| Other metal                     | 3          | 1.9          |
| Fines                           | 93         | 60           |
| Liquids                         | 0          | 0            |
| <b>Total</b>                    | <b>155</b> | <b>100</b>   |

**Table III Domestic Wastes from Medium (Areas 14,15&47)**

| Type of Waste                   | Weight/ Kg | Percentage % |
|---------------------------------|------------|--------------|
| Food Waste and Vegetable Matter | 112        | 71.8         |
| Paper                           | 13.5       | 1.3          |
| Cardboard                       | 0          | 0            |
| Plastic film                    | 10         | 6.4          |
| Other Plastics                  | 2.5        | 1.6          |
| Textiles                        | 1          | 0.6          |
| Wood                            | 0          | 0            |
| Leather and Rubber              | 0          | 0            |
| Glass                           | 2          | 1.3          |
| Metal cans                      | 2          | 1.3          |
| Other metal                     | 0          | 0            |
| Fines                           | 13         | 8.3          |
| Liquids                         | 0          | 0            |
| <b>Total</b>                    | <b>156</b> | <b>100</b>   |

**Table IV Domestic Wastes from Low Density (Area 43)**

| Type of Waste                   | Weight/ Kg   | Percentage % |
|---------------------------------|--------------|--------------|
| Food Waste and Vegetable Matter | 106          | 69.5         |
| Paper                           | 14.3         | 9.4          |
| Cardboard                       | 0            |              |
| Plastic film                    | 10.5         | 6.9          |
| Other Plastics                  | 3.6          | 2.4          |
| Textiles                        | 0.5          | 0.3          |
| Wood                            | 0            |              |
| Leather and Rubber              | 0            |              |
| Glass                           | 1.5          | 1.0          |
| Metal cans                      | 4.1          | 2.7          |
| Other metal                     | 0            |              |
| Fines                           | 12           | 7.9          |
| Liquids                         | 0            |              |
| <b>Total</b>                    | <b>152.5</b> | <b>100</b>   |

CONCLUSION

## Appendix I

### TERMS OF REFERENCE

#### 1 MSW COMPOSITION ANALYSIS

**Equipment required:** Platform scale, rakes, protective clothing, woven polypropylene, sieve of gauge - 10 mm (e.g a garden sieve), a bucket to drain liquids from bottles and other containers.

**Staff required:** At least 2 men plus supervision for 2 or 3 days

**Method:**

Select a compactor truck with a REPRESENTATIVE sample of waste.

Unload the truck onto a clean, dry, level soil or glass surface. The analysis should be done on a dry day, when the rain is no forecast.

Each personnel should be provided with gloves, boots and overall.

The emptied pile of waste should be levelled to a depth of 0.6m and larger items removed. Items of the following categories should be placed in sacks, preferably of woven polypropylene, and weighed on a platform scale of 100-200 kg capacity, ideally reading to 0.2Kg or better:

|                                 |                      |
|---------------------------------|----------------------|
| Food waste and vegetable matter | Leather              |
| Paper                           | Glass                |
| Cardboard                       | Metal cans           |
| Plastic film                    | Other metals         |
| Other plastics (e.g. bottles)   | "Fines" i.e dust etc |
| Textiles                        | Liquids              |
| Wood                            |                      |

After picking over the pile the remaining material should be raked into a pile of 0.4 m depth and the hand picking process repeated. The pile should then be raked to a depth of 0.2 m and a final hand picking process undertaken.

Bottles containing liquid (if any) should be emptied into a container which is weighed empty and full to calculate the weight of liquid.

The pile should then be thoroughly mixed, build into a pile divided into quarters, taking 2 opposite quarters to provide a sub-sample for analysis down to approximately 10mm. This can be achieved by sieving. The sub-sample should then be separated to remove paper, plastics and food waste which can be separately weighed. The remainder of "fines" (dust, soil etc) and any other unclassified matter should then also be weighed.

It is important to record the total weight of the entire sample, as this is needed to assess the total quantity of waste.

Records should be made of the weight of each material, together with the entire sample.

#### 2 PROVIDE OTHER INFORMATION AS REQUESTED