

# **SUSTAINABLE SANITATION SOLUTIONS IN AFRICAN CITIES STUDY PROJECT**

**Case Study of Cesspool Emptiers in Kampala**

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## 1.0 ACCOMMODATION AND OCCUPANTS

### 1.0.1 The Area

The study was carried out in four divisions of Kampala namely; Rugaga, Kawempe, Nakawa and Makindye.

#### Quality of the area analysis

The quality of the area was analyzed using 7 indicators i.e. Planning, age of settlement, periphery, permanency, population density, income levels and legality of occupants, and all these had to be put together.

A weighting index was hence developed based on these indicators to have three broad categories- Good, fair and bad.

<u>Indicator</u>	<u>Weight</u>
Planned	2
Unplanned	1
Old Settlement	1
Recent Settlement	2
Central periphery	3
Close periphery	2
Far periphery	1
Permanent	3
Semi-permanent	2
Precarious	1
High density	1
Medium density	2
Low density	3
High income	3
Medium income	2
Low income	1
Legal occupation	2
Illegal occupation	1

A total was computed and then regrouped to give the good, fair and poor qualities of places.

#### *Physical Planning*

Several indicators were used to measure the quality of places where households interviewed are located. Among the indicators was planning of the area. The 4 divisions visited in Kampala city, people said it was not planned as shown in the TABLE 1 below.

**TABLE 1 PLANNING OF AREA**

AQLTPLAN	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
Planned	2	6.3	2	6.3	7	29.2	4	50.0
Unplanned	30	93.8	30	93.8	17	70.8	4	50.0
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

In all the divisions, about 90% of households reported that their areas of residence were unplanned. In Nakawa division, however, about 30% of households were located in planned areas while in Makindye, 50% of households are in a planned area.

#### *Age of settlement*

The age of settlements in terms of old or new, was reported as indicated in TABLE 2.

**TABLE 2 AGE OF SETTLEMENT**

BQLTAGE	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
Old	25	78.1	31	96.9	20	83.3	8	100.0
Recent	7	21.9	1	3.1	4	16.7		
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

Apart from Rubaga division where 22% of the households interviewed were in recent settlements, more than 80% of households are located in old settlements.

#### *Proximity to City Centre*

Households were also to indicate the proximity of the areas to the city centre and the results in TABLE 3 show people's perception.

**TABLE 3 PROXIMITY TO CITY CENTRE**

CQLTPERI	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
Close periphery	28	87.5	31	96.9	17	70.8	1	12.5
Central	0	0	0	0	0	0	0	0
Far periphery	4	12.5	1	3.1	7	29.2	7	87.5
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

There was no single household in central periphery, though majority in Rubaga (87.5%) and Kawempe (97%) reported close periphery. In Nakawa, however, the proportion was a little smaller (70.8%) while in Makindye it was almost a direct opposite of the other divisions where 87.5% reported to be in far periphery.

**TABLE 4 PERMANENCE**

DQLTPERM	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
Permanent	12	37.5	8	25.0	10	41.7	8	100.0
Semi-permanent	19	59.4	22	68.8	14	58.3		0
Precarious	1	3.1	2	6.3		0		0
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

The precarious households were the least in Rubaga (3.1%), Kawempe (6.3%) and were non-existent in Nakawa and Makindye. Majority of the households were in semi-permanent structures with the highest in Kawempe (68.8%).

#### *Population Density*

Since the population density of an area has a lot of influence on the sanitation, respondents were asked to indicate the way they perceive population density around their homes and the results are indicated in TABLE 5.

**TABLE 5 POPULATION DENSITY OF THE AREA**

EQLTYPOP	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
High density	15	46.9	19	59.4	10	41.7		0
Medium density	14	43.8	12	37.5	14	58.3	8	100.0
Low density	3	9.4	1	3.1	0	0		0
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

Households located in low-density areas were very few in Rubaga (9.4%) and Kawempe (3.1%) and were non-existent in Nakawa and Makindye. In Rubaga, those located in high and medium density areas were almost equal, (46.9%) and (43.8%) respectively with 59.4% in Kawempe located in highly



populated areas. All households in Makindye were in medium density areas with 58.3% in Nakawa division.

### *Income levels*

The income levels of residents were reported as indicated in TABLE 6.

**TABLE 6 INCOME LEVELS**

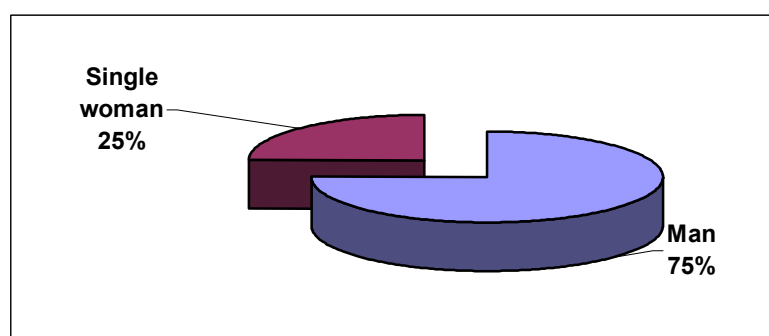
FQLTINCO	Rubaga		Kawempe		Nakawa		Makindye	
	No	%	No	%	No	%	No	%
High income	1	3.1	1	3.1	2	8.3	1	12.5
Medium income	18	56.3	15	46.9	20	83.3	6	75.0
Low income	13	40.6	16	50.0	2	8.3	1	12.5
<b>Total</b>	<b>32</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>

Most of the households interviewed were medium income earners with the highest in Nakawa (83.3%) while Kawempe reported the highest percentage of households (50%) to be low-income earners. Makindye reported the highest percentage of households (12.5%) to be high-income earners.

### **1.0.2 The household**

Households were asked to give their background information, this is summarized in the tables and charts below.

**CHART 1 SEX OF HEAD OF HOUSEHOLD**



Most of the households interviewed were headed by men as illustrated in the TABLE above and this was independent of the division.

**TABLE 7 TYPE OF BUILDING**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Very precarious	2	8.0	2	7.4		0		0	4	4.8
Semi-permanent	8	32.0	9	33.3	3	12.5		0	20	23.8
Permanent	14	56.0	16	59.3	20	83.3	8	100.0	58	69.0
Flat	1	4.0		0		0		0	1	1.2
Villa		0		0	1	4.2		0	1	1.2
<b>TOTAL</b>	<b>25</b>	<b>100.0</b>	<b>27</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>84</b>	<b>100</b>

69% of the households interviewed were staying in permanent buildings and 23.8% in semi-permanent buildings. The number of rooms in a house depended on the type of building for example on average 3 rooms in a semi-permanent building, while 4 rooms in permanent houses. The very precarious houses had one room each, while the flat and villa had 6 and 12 rooms respectively.

### *Year of settlement in the City*

The period of household settlement in the city was analyzed and the distribution is as shown in TABLE 8 below.

**TABLE 8 PERIOD OF HOUSEHOLD SETTLEMENT IN THE CITY**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Before 1980	8	24.2	13	40.6	15	57.7	3	37.5	39	39.4
1981-1990	9	27.3	7	21.9	10	38.5	3	37.5	29	29.3
1991-2000	16	48.5	11	34.4	1	3.8	2	25.0	30	30.3
After 2000		0.0	1	3.1		0.0		0.0	1	1.0
<b>TOTAL</b>	<b>33</b>	<b>100.0</b>	<b>32</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>

Most households moved into the city before 1980, in Rubaga division majority (48.5%) settled in the city between 1991 and 2000. In Nakawa division, 58% of households settled in the city before 1980 and a few households settled in the city after 2000. This indicates how established these households are in the city.

#### *Year of house occupancy*

Emptying of the cesspit much depends on the time the household has occupied the house and information about the period of house occupancy was provided as shown in TABLE 9 below.

**TABLE 9 PERIOD OF HOUSE OCCUPANCY**

YEAR H'SE	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Before 1980	5	15.6	5	15.2	3	11.5	3	37.5	16	16.2
1981-1990	9	28.1	9	27.3	9	34.6	2	25.0	29	29.3
1990-2000	17	53.1	17	51.5	13	50.0	2	25.0	49	49.5
After 2000	1	3.1	2	6.1	1	3.8	1	12.5	5	5.1
<b>TOTAL</b>	<b>32</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>

Majority of the households in all divisions occupied the houses between 1990 and 2000 with the highest percentage (53.1%) in Rubaga division.

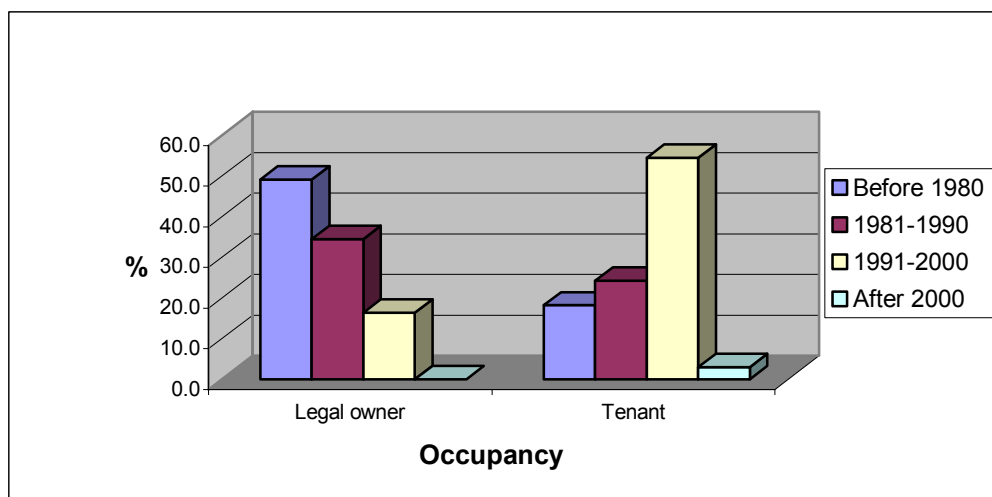
It was also observed in all divisions that a small percentage (5.1%) of the households occupied the houses after 2000 and 16.2% occupied those houses way back before 1980.

**TABLE 10 MODE OF OCCUPANCY**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Legal owner	22	68.8	16	48.5	18	72.0	5	100.0	61	64.2
Illegal occupation	0	0	0	0	0	0	0	0	0	0
Tenant	10	31.3	17	51.5	7	28.0		0.0	34	35.8
<b>TOTAL</b>	<b>32</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>	<b>5</b>	<b>100.0</b>	<b>95</b>	<b>100.0</b>

Most households reported that they were legal owners of the houses. However, in Kawempe division there were more tenants at 51.5% than legal owners of the houses.

### **CHART 2 RELATIONSHIP BETWEEN PERIOD OF HOUSE OCCUPANCY AND YEAR OF SETTLEMENT IN THE CITY**



Data indicated that household heads who moved into the city in before 1990s stood high chances of being in their own houses than those who recently moved to the city (after 1991). This is illustrated in the chart above and the statistics of test of independence ( $X^2=18.41$ ,  $DF=3$   $P=0.00036$ ).

Households interviewed had an average of 6 people per household. In all divisions, 3 children and 3 adults were reported. The details are shown in the TABLE 11.

**TABLE 11 AVERAGE NUMBERS OF PEOPLE IN A HOUSEHOLD**

Division	Average number of people		
	Adults	Children	Overall
Rubaga	3	3	6
Kawempe	3	3	5
Nakawa	3	3	6
Makindye	3	3	5
Overall mean	3	3	6

## 2.0 HOUSEHOLD BUDGET AND EXPENDITURE

A number of questions about household incomes and expenditures were asked to the household heads and among them are connection to NWSC and Uganda Electricity Board.

**TABLE 12 CONNECTION TO NWSC**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Yes	11	33.3	7	21.2	5	19.2	8	100.0	31	31.0
No	22	66.7	26	78.8	21	80.8		0.0	69	69.0
<b>Total</b>	<b>33</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

There was a strong relationship between a household being connected to NWSC services and the division where the household was located ( $X^2=21.05$ ,  $DF=3$ ,  $P=0.0001$ ). In Makindye all households were connected and in other divisions an average of 7 out of every 10 households interviewed were not connected to NWSC services.

On average, households were getting services 21 hours/day independent of the division. Only 15 out of 100 households had water tanks.

**TABLE 13 SOURCE OF WATER**

	Rubaga	Kawempe	Nakawa	Makindye	Total
--	--------	---------	--------	----------	-------

	No	%	No	%	No	%	No	%	No	%
Surface H <sub>2</sub> O	5	22.7	1	3.8	1	5.3	0	0	7	10.4
Private well	0	0.0	1	3.8		0.0	0	0	1	1.5
Neighbor	9	40.9	15	57.7	13	68.4	0	0	37	55.2
Carrier	3	13.6	1	3.8		0.0	0	0	4	6.0
Other	5	22.7	8	30.8	5	26.3	0	0	18	26.9
<b>Total</b>	<b>22</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>	<b>19</b>	<b>100.0</b>	<b>0</b>	<b>0</b>	<b>67</b>	<b>100.0</b>

Households that were not connected to NWSC services provided information about alternative sources of water and these included neighbors 55.2%, surface water 10.4% and carriers 6.0%.

The connections to UEB were found to be independent of the location of the household as shown in TABLE 14.

**TABLE 14 CONNECTION TO UEB POWER GRID**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
<b>UEBCONET</b>			<b>2</b>		<b>3</b>		<b>4</b>			
Yes	19	59.4	25	75.8	16	61.5	8	100.0	68	68.7
No	13	40.6	8	24.2	10	38.5		0.0	31	31.3
<b>TOTAL</b>	<b>32</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>26</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>

About 70% of the households interviewed were connected to the UEB grid in the area. The trend was similar in all the divisions.

Households indicated that the main source of energy used in cooking was charcoal at 87.8%, while very few households used other sources of energy. This was independent of the locations of the households.

### 2.0.1 Rough estimate of the main incomes of the households.

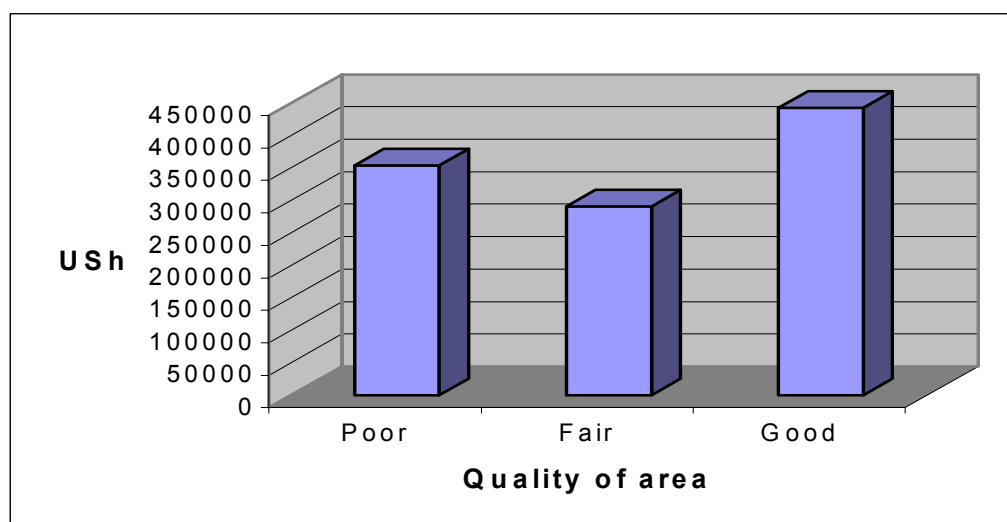
**TABLE 15 MONTHLY HOUSEHOLD INCOMES**

<b>Division</b>	<b>Monthly average income</b>
Rubaga	311,000
Kawempe	295,413
Nakawa	430,278
Makindye	417,143
<b>Overall Mean</b>	<b>345,678</b>

The figures of monthly incomes in divisions did not show big variations though Kawempe had a lower average of US\$ 295,413 than the rest, and the overall household average monthly income was US\$ 345,678.

Household income can be estimated by looking at the expenditure therefore households reported their expenditure patterns on the key areas. The areas included house rent, food, transport, taxes, education etc. and the total of which was computed and the results are indicated in TABLE 16.

**CHART 3 AVERAGE INCOME BY QUALITY OF AREA**

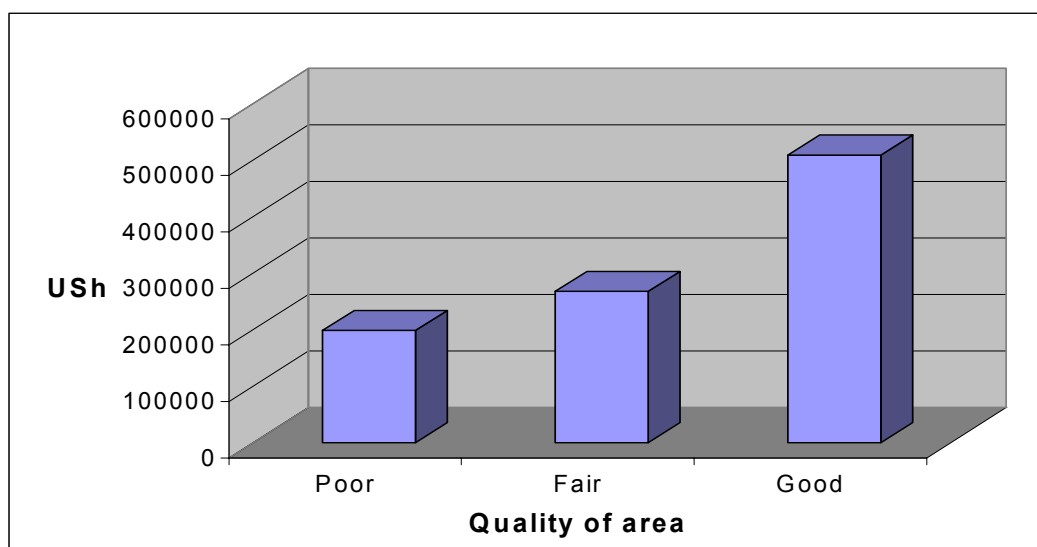


When average monthly household incomes were further analyzed, they revealed a strong relationship with the quality of area, though this was not direct. This was due to the fact that households found it hard to reveal information about incomes. The analysis was done using the ANOVA that showed F ratio = 2.0558 and F prob =0.136. The chart above shows that households in fair locations had minimum household incomes whereas those in good places had the highest. However, this anomaly is corrected by studying the expenditure patterns of a household.

**TABLE 16 MONTHLY HOUSEHOLD EXPENDITURE**

	Monthly Average expenditure
Rubaga	173,368
Kawempe	275,741
Nakawa	333,742
Makindye	868,488
Overall expenditure	304,458

**CHART 4 AVERAGE EXPENDITURE BY QUALITY OF AREA**



It was noted that in some divisions, like Makindye household incomes were underestimated where as in Rubaga they were overestimated. However, the general trend indicated that peoples' incomes are approximately USh 300,000 per month.

This clearly shows that the average monthly household expenditure follows the socially accepted norms, where people in poor areas are expected to be relatively low-income earners and hence spend less than those in good places who are expected to be spending more. This is further confirmed with the ANOVA statistics (F Ratio =3.5106, F prob. =0.034).

### 3.0 DRAINAGE AND SEWERAGE

Drainage and sewerage facilities at the household level formed part of this study and the following are summaries of the responses from households.

#### 3.0.1 Precise description of the drainage facilities

**TABLE 17 DESCRIPTION OF DRAINAGE FACILITIES**

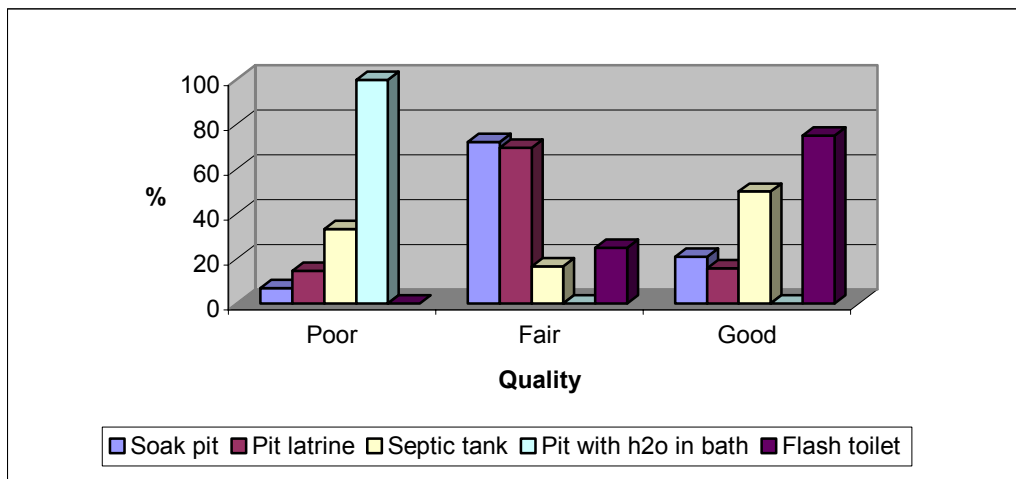
DRAINAGE	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Soak pit	11	33.3	12	36.4	12	48.0	8	100.0	43	43.4
Pit latrine	32	97.0	29	87.9	21	84.0	7	87.5	89	89.9
Septic tank	1	3.0	1	3.0	4	16.0	0	0.0	6	6.1

Pit with h <sub>2</sub> O in bath	0	0.0	0	0.0	1	4.0	0	0.0	1	1.0
Flush toilet	1	3.0	3	9.1	3	12.0	1	12.5	8	8.1
<b>Total</b>	<b>33</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>

Pit latrines were the most common drainage facilities used by households at 90% followed by soak pit at 43% and flush toilets at 8.1%.

On analyzing the situation further, it was found that the quality of the area where the household is located had a relationship with the drainage facilities used at household level. This is shown in the figure below.

**CHART 5      RELATIONSHIP BETWEEN DRAINAGE FACILITY AND QUALITY OF PLACE**



Households with cesspits were to comment on how well these pits were constructed, and the ratings are as indicated in TABLE 18.

TABLE 18 HOW WELL IS CESSPIT CONSTRUCTED

CESSWELL	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Good	2	22.2	6	40.0	8	53.3	4	80.0	20	45.5
Fair	7	77.8	7	46.7	7	46.7	1	20.0	22	50.0
Precarious		0.0	2	13.3		0.0		0.0	2	4.5
<b>Total</b>	<b>9</b>	<b>100.0</b>	<b>15</b>	<b>100.0</b>	<b>15</b>	<b>100.0</b>	<b>5</b>	<b>100.0</b>	<b>44</b>	<b>100.0</b>

Most households rated their cesspit construction to be fair with the highest percentage (77.8%) in Rubaga division. However, most households (80%) in Makindye division rated their cesspit construction to be good. In Kawempe and Nakawa divisions, the percentage of households that rated their cesspits to be good and fair were not significantly different. Kawempe division had the highest percentage (13.3%) of precariously constructed cesspits.

*Dirty Water Discharge*

TABLE 19 and 20 indicate the different ways through which dirty water from the kitchen and bathroom is discharged at household level.

TABLE 19 HOW DIRTY WATER FROM KITCHEN IS DISCHARGED

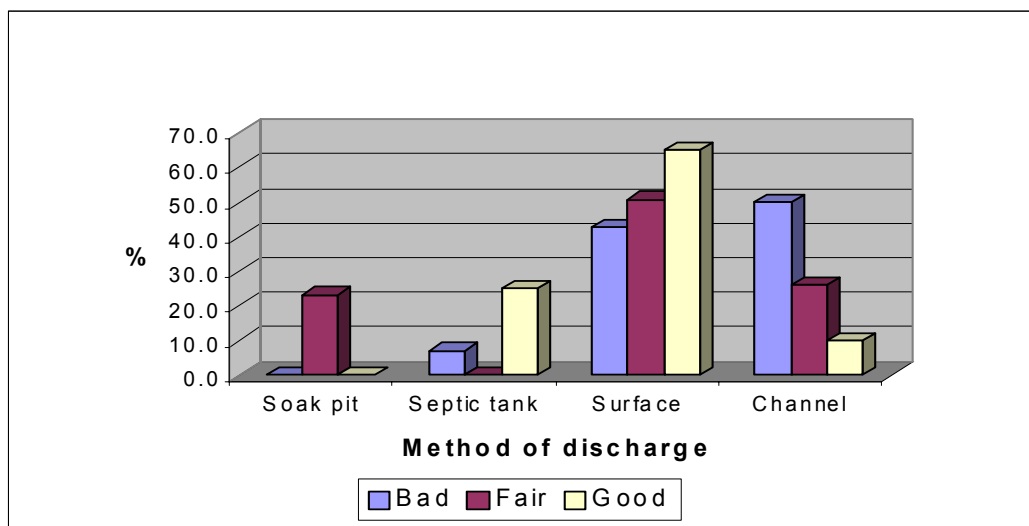
KITH <sub>2</sub> O	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Soak pit	5	15.2	2	6.1	4	16.0	4	50.0	15	15.2
Septic tank	1	3.0		0.0	4	16.0	1	12.5	6	6.1
Surface	15	45.5	20	60.6	14	56.0	3	37.5	52	52.5
Channel	12	36.4	11	33.3	3	12.0		0.0	26	26.3
<b>Total</b>	<b>33</b>	<b>100.0</b>	<b>33</b>	<b>100.0</b>	<b>25</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>99</b>	<b>100.0</b>

Most households use the surface (52.5%) to discharge water from kitchen and (26.3%) use channels- these in most cases are open channels. This trend was common in the 4 divisions of Kampala visited apart from Makindye where most of its residents visited used soak pits (50%), however, the surface still contributed more than a third (37.5%).

On further analysis, it was observed that a strong relationship existed between the method of discharging dirty water from the kitchen and the quality of the area where the household is located (X<sup>2</sup>=29.55, DF=6, P=0.00005).

This is clarified by the visual check on the chart below. Soak pits were commonly used by households that were identified to be in fair areas, where as the septic tanks were commonly used by households located in good areas.

CHART 6 WHERE DIRTY WATER FROM KITCHEN IS DISCHARGED BY QUALITY OF AREA



**TABLE 20 HOW DIRTY WATER FROM BATHROOM IS DISCHARGED**

BATH H <sub>2</sub> O	Rubaga		Kawempe		Nakawa		Makindye		No	%
	No	%	No	%	No	%	No	%		
Soak pit	5	15.2	10	32.3	13	54.2	7	87.5	35	36.5
Septic tank	1	3.0	1	3.2	4	16.7	1	12.5	7	7.3
Surface	15	45.5	8	25.8	3	12.5		0.0	26	27.1
Channel	12	36.4	12	38.7	4	16.7		0.0	28	29.2
<b>TOTAL</b>	<b>33</b>	<b>100.0</b>	<b>31</b>	<b>100.0</b>	<b>24</b>	<b>100.0</b>	<b>8</b>	<b>100.0</b>	<b>96</b>	<b>100.0</b>

Most households use soak pit to discharge dirty water from bathrooms with the highest percentage (87.5%) in Makindye division. The same observation was made in the case of dirty water discharge from the Kitchen for Makindye. Other common ways included surface (27.1%) and channel (29.2%).

Like for the case of dirty water from the kitchen, a relationship was found to be existing between the quality of area where the household is located and the method of discharging water from bathroom ( $X^2=19.11$ ,  $DF=6$ ,  $P=0.004$ ). For example, households located in good and fair areas mainly used soak pits, those in good areas used septic tanks. The surface method was used by all households irrespective of their location and the channel was mainly used by those in poor and fair areas.

*Sharing of Cesspit*

In Rubaga division, 4 households reported that they were each sharing one cesspit with 4 households and in Kawempe, 6 households share each with 4 other households. However, in Nakawa division, 6 households reported to be sharing one cesspit with 7 other households.

**CHART 7 AVERAGE NUMBER OF HOUSEHOLDS THAT SHARE CESSPIT**





It was observed that households in poor areas stood higher chances of sharing one cesspit with many households than those located in other areas as indicated in the chart above.

**TABLE 21 DISTANCE OF PIT LATRINE /SOAK PIT FROM THE HOUSE**

	how far is pit
Rubaga	7.7
Kawempe	7.0
Nakawa	7.9
Makindye	7.5

Most of the pit latrines/soak pits were located about 8 meters away from the house apart from Kawempe where it was 7 meters. The data never showed any significant difference in the average distances of the pit latrines/soak pits from the houses by quality of the area when ANOVA was performed at 95% confidence level (F Ratio=0.005 and F. Prob. =0.9946).

In poor areas, they are located on average 7.6 meters, 7.5 meters in fair areas and in good areas at a distance of 7.5 meters. This does not indicate a significant difference.

**TABLE 22 VOLUME OF THE PIT IN CUBIC METERS**

	Volume of pit (m <sup>3</sup> )
Rubaga	14.4
Kawempe	31.2
Nakawa	35.6
Makindye	43.3

The volumes of the cesspits on average ranged from 14.4 cubic meters in Rubaga to 43.3 cubic meters in Makindye. Though these were different by division, they were not significantly different by the quality of area where the households were located. The ANOVA statistics showed that (F. Ratio = 0.094, F. Prob. =0.9109). In poor areas, the average volume was 28.3 m<sup>3</sup>, 30.4 m<sup>3</sup> in fair areas and 28.8 m<sup>3</sup> in good areas, which indicates no significant difference.

#### 4.0 RELATIONSHIP WITH CESSPOOL EMPTYING COMPANIES

Households were interviewed on their relationship with cesspool emptying companies and the methods employed to empty their cesspits. The following are some of the responses on how they empty their cesspits.

**TABLE 23 METHOD EMPLOYED TO EMPTY CESSPIT**

	Rubaga		Kawempe		Nakawa		Makindye		Total	
	No	%	No	%	No	%	No	%	No	%
Manually	11	35.5	4	25.0	3	42.9	0.0	0.0	18	33.3
By truck	18	58.1	5	31.3	4	57.1	0.0	0.0	27	50.0
Left free	2	6.5	6	37.5		0.0	0.0	0.0	8	14.8
Others		0.0	1	6.3		0.0	0.0	0.0	1	1.9
<b>TOTAL</b>	<b>31</b>	<b>100.0</b>	<b>16</b>	<b>100.0</b>	<b>7</b>	<b>100.0</b>	<b>0.0</b>	<b>0.0</b>	<b>54</b>	<b>100.0</b>

The common methods used by households to empty cesspits are trucks at 50% and manual at 33.3%. The method of leaving sewerage to dry freely was more common in Kawempe at 37.5% than in any other division and overall, about 15% left them free.

However, Makindye mainly uses septic tanks and therefore does not use any of the methods mentioned above.

Other than the method used to empty the cesspit, it was also deemed necessary to find out who actually does the emptying, and this is illustrated in TABLE 24.

**TABLE 24 WHO EMPTIES THE CESSPIT**

	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Member of family	0	0.0	1	9.1		0.0	1	2.2
Artisan-manually	11	37.9	5	45.5	2	33.3	18	39.1

Company	3	10.3	1	9.1	1	16.7	5	10.9
City truck	14	48.3	3	27.3	1	16.7	18	39.1
NWSC truck	1	3.4	1	9.1	2	33.3	4	8.7
<b>Total</b>	<b>29</b>	<b>100.0</b>	<b>11</b>	<b>100.0</b>	<b>6</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>

A big percentage of households use artisan-manually at 39.1%, city trucks (39.1%) and companies (10.9%) to empty their cesspits. Other people/companies provide cesspit emptying services; these include NWSC truck 8.7%, and member of family 2.2%. The trend was the same in the three divisions.

### Responsibility of paying

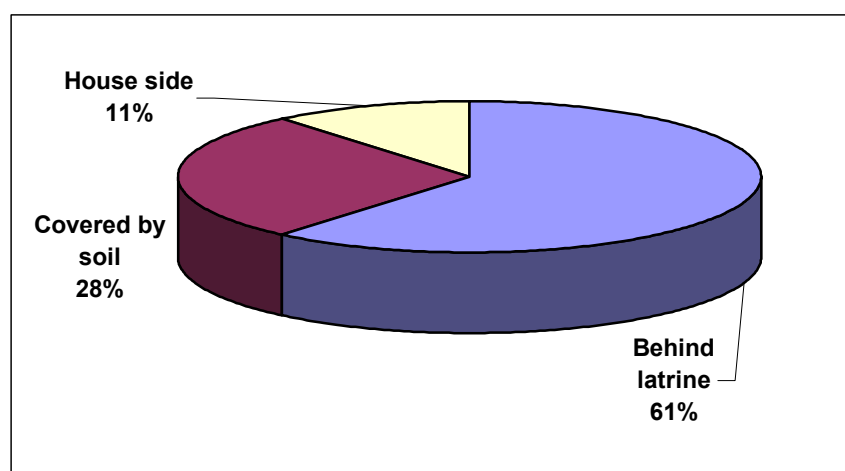
Different ways of meeting the emptying costs were as shown in TABLE 25 below;

**TABLE 25 RESPONSIBILITY OF PAYING FOR THE CESSPIT EMPTIER**

	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Tenants- rent	4	12.9	1	10.0		0.0	5	10.9
Tenants-paid separately from rent	24	77.4	8	80.0	5	100.0	37	80.4
Landlord	3	9.7	1	10.0		0.0	4	8.7
<b>Total</b>	<b>31</b>	<b>100.0</b>	<b>10</b>	<b>100.0</b>	<b>5</b>	<b>100.0</b>	<b>46</b>	<b>100.0</b>

The costs of emptying cesspits at household level was found to be mainly met by tenants who pay this cost as an addition to the rent (80.4%), while some landlords make tenants pay the cost with in rental charges (10.9%). In few cases, landlords have been paying the costs (8.7%). This trend is true in all the divisions of Rubaga, Kawempe and Nakawa.

**CHART 8 WHERE IS SEWERAGE BURIED/DISCHARGED**



The data revealed that most of the sewerage is buried behind latrines (61%), covered by soil (28%) and buried on house side (11%).

**TABLE 26 COST OF EMPTYING THE CESSPIT**

Division	Minimum cost	Maximum cost	Average cost
Rubaga	64,107	84,655	51,111
Kawempe	61,250	52,500	35,000
Nakawa	107,500	70,000	130,000
Makindye	0	0	0
<b>Average</b>	<b>67,875</b>	<b>79,595</b>	<b>60,000</b>

Overall, the minimum cost of emptying cesspit is USh 67,875 with the highest recorded in Nakawa of USh 107,500. The maximum cost was USh 79,595 with Rubaga recording the highest as USh 84,655. The average cost of emptying according to households was USh 60,000.

### Variation of costs with season

Households in all the divisions reported that the cost of emptying the cesspit during rainy seasons was higher at an average of US\$ 71,786 than in the dry seasons at an average cost of US\$ 65,667 as shown in TABLE 27 below.

**TABLE 27 SEASONAL COSTS**

Division	Dry cost	Rainy cost	Last emptying cost
Rubaga	66,250	73,182	70,345
Kawempe	40,000	50,000	63,333
Nakawa	75,000	75,000	131,000
Makindye	0	0	0
<b>Average</b>	<b>65,667</b>	<b>71,786</b>	<b>75,930</b>

The last cost of emptying cesspit that was paid by households was at an average of US\$ 75,930.

**TABLE 28 TIMES EMPTYING CESSPIT**

Division	Times empty per year	Times empty last year
Rubaga	1.68	1.72
Kawempe	2.02	2.11
Nakawa	0.88	0.67
Makindye	0	0
<b>Average</b>	<b>1.65</b>	<b>1.65</b>

The households that have been emptying their cesspit indicated it to be about twice a year, and the emptying was reported to have been done twice last year.

**TABLE 29 HOW DID HOUSEHOLDS GET TO KNOW ABOUT CESSPOOL EMPTYING COMPANY**

KNOWCESS	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Neighbors	9	39.1	2	25.0	1	25.0	12	34.3
Landlord	12	52.1	5	62.5	1	25.0	18	51.4
Others	2	8.7	1	12.5	2	50.0	5	14.3
<b>TOTAL</b>	<b>23</b>	<b>100</b>	<b>8</b>	<b>100</b>	<b>4</b>	<b>100</b>	<b>35</b>	<b>100</b>

Most of the households got to know the companies through landlords (51.4%) and neighbors (34.3%). This was generally true in the divisions of Rubaga and Kawempe. However, in Nakawa, it was mainly through other means like newspapers and friends that they got to know such companies.

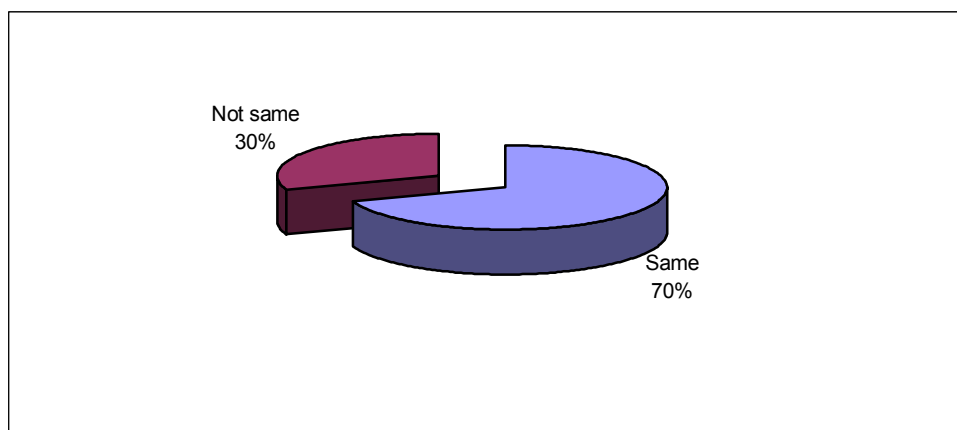
Since the study was also interested in getting the full details of how the public gets in touch with these companies, the households response in TABLE 26 below shows the exact means of contacting the cesspool emptying company by the house holds. It should be noted however, that they did not vary with the division where the household is located.

**TABLE 30 METHOD OF CONTACTING THE COMPANY**

CONTCCESS	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Phone	2	8.7	0	0	1	25	3	8.8
Middlemen	20	87.0	5	71.4	2	50	27	79.4
Other	1	4.3	2	28.6	1	25	4	11.8
<b>TOTAL</b>	<b>23</b>	<b>100</b>	<b>7</b>	<b>100</b>	<b>4</b>	<b>100</b>	<b>34</b>	<b>100</b>

The most frequent means of contacting the company was use of middlemen (79.4%) and other means. Telephones were to some extent used more so by the Nakawa residents (25%) and Rubaga residents (8.7%).

**CHART 9 USE OF SAME COMPANIES**



It was found out that most households prefer to use the same companies they had used before to empty their cesspits as seen in the chart above and the reasons given are expressed in TABLE 27 below.

**TABLE 31 REASONS FOR USING THE SAME COMPANY**

WHY SAME	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Come quickly	6	40.0	1	20	2	66.7	9	39.1
Low price	1	6.7		0		0	1	4.4
Good experience	7	46.7	1	20	1	33.3	9	39.1
Others	1	6.7	3	60		0	4	17.4
<b>TOTAL</b>	<b>15</b>	<b>100</b>	<b>5</b>	<b>100</b>	<b>3</b>	<b>100</b>	<b>23</b>	<b>100</b>

The reasons mainly given had a lot to do with efficiency and effectiveness of the companies when doing the work. Such reasons included coming quickly (39.1%) and having good experience (39.1%). The issue of low price was not so important (4.4%), which indicated that households are willing to pay for services as long as work is effectively done in the right time.

TABLE 28 shows the levels of satisfaction with the services rendered by the companies as they empty the cesspits.

**TABLE 32 LEVEL OF SATISFACTION**

	Rubaga		Kawempe		Nakawa		Total	
	No	%	No	%	No	%	No	%
Very satisfied	11	61.1		0	1	25.0	12	42.7
A bit Satisfied	4	22.2	2	33.3	1	25.0	7	25.0
Not satisfied	3	16.7	4	66.7	2	50.0	9	32.1
<b>Total</b>	<b>18</b>	<b>100</b>	<b>6</b>	<b>100</b>	<b>4</b>	<b>100</b>	<b>28</b>	<b>100</b>

Most households reported that they were satisfied 67.7% with the services as opposed to 32.1% who were not at all satisfied. The reasons for their satisfaction (for those who are satisfied) are the same as the ones given for using the same companies.

There was no household that reported to have ever paid a fine to the urban authorities related to the cesspit.

## 5.0 TYPOLOGY OF CUSTOMERS

Most customers for the cesspool companies are from the informal settlements where about 60% of the Kampala residents stay. Land ownership and usage in Kampala occurs in four different tenure arrangements. The nature of the land tenure determines and influences the planning, development and control of urban settlements in the city. The land owned by urban authorities has been easier to plan and resulted in adequate provision of both piped water supply services and sewer lines. On the other hand, privately owned land, which accounts for 65% of the city area, encourages unauthorized settlements especially by the low-income communities. Hence about 80% of the area covered by informal settlements is on private land. The land is not planned and therefore not provided with any form of municipal services.

The problem of topology is another serious constraint that further complicates human excreta management in informal settlements that are located in marshy areas. These areas are poorly drained with a high water table, which prohibits construction of deep pit latrines. This problem has resulted in construction of shallow toilets, which fill up quickly and yet land for digging new ones is limited. The residents are therefore compelled to frequently empty the pit latrines.

Sewers serve about 7% of the city residents who occupy about 20% of the built up area. The newly developed parts of the city are planned and are usually inhabited by middle-income earners who install septic tanks. Because family sizes are small the septic tanks take long to fill up, typically up to 10 years before they require emptying.

Hence cesspool emptiers practically service 93% of the population who occupy 80% of the city area and the bulk of their market is in the informal settlements. About 90% of these customers come to the parking site in Bugolobi for the services and 10% contact the truck operators on phone.

Poverty is a common denominator in all the informal settlements of Kampala. The population in the settlements mainly comprises the urban poor who strive to eke out a living in the urban wider economy. This population represents enclaves with the highest population densities in the city. Residents are mainly engaged in petty trading and casual manual work. A recent survey found that almost 40% of males and 49% of females were engaged in small-scale informal activities and businesses. Incomes range from USh 10,000 to 285, 000 (USD 5 – 142) per month that is earned on a day to day basis. According to official statistics, about 35% of residents survive on less than one United States dollar per day. This situation has serious implications on ability and willingness to pay for cesspool emptier services and hence the significance of alternative coping mechanisms like manually emptying pits into the environment and the use of ‘flying toilets’.

### *Institutional Capacity*

In terms of service provision, KCC considers informal settlements to be a temporary inconvenience that will disappear with time and hence it pays little attention to these slums in terms of planning and infrastructure support. For instance in the Kampala Urban Structure Plan of 1994, areas covered by informal settlements are indicated as unoccupied. On the other hand NWSC insists that residents in informal settlements are risky customers because of their transient nature and therefore do not qualify for traditional service provision arrangements. The supply driven nature of service provision by NWSC and KCC whereby the market seeks out the provider has proved to be a serious constraint to service access by the urban poor. Residents of informal settlements have in the past been harassed by public agencies, which accuse them of a wide range of crimes. Hence the relationship between residents of informal settlements and agencies is not cordial to the extent that the former feel safer dealing with SSiPs on matters of service access

## **6.0 INVENTORY OF THE COMPANIES**

All companies are registered and majority of them belong to individuals. However, the names of these companies could not be established. The list below shows truck operators and registration numbers of their vehicles.

1)	George Luyirika	UAA 496T
2)	Badru Mukwaya	UAA 332T
3)	Isima	UAB 490K
4)	Tom Kipaku	UAB 815e
5)	John Serubiri	UAA 914R
6)	Sula	UAB 249U
7)	Senabulya	UAA 690U
8)	Kyeyune	UAB 704G
9)	Nsubuga Murishid	UCS 701
10)	Siraje Kiyimba	LG 0032-01 (Local Government KCC)
11)	Lwanga	UP 0359 (Police)
12)	Kamya	UG 0074S (DWD Luzira)
13)	Bosco Mutyaba	UAB 526H
14)	U.P.D.F	H4 DF 090

It is of interest to note that Mr. Luyirika is a former employee of NWSC who voluntarily retired and used his retirement package to purchase the utility cesspool he used to drive. The vehicle is now on the market providing the same services but with private management. He is also the chairman of the Cesspool Emptier Operators Association.

The trucks have a pump, which uses the engine of the vehicle to pump the sewage from the pits or septic tanks. About 90% of the personnel employed have been trained on job and have at least attained formal education up to primary seven level. 10% have gone up to secondary level. By virtue of the nature of work carried out, most people do not opt for this kind of business.

From the people interviewed, it was found out that it only takes one to know how to drive a vehicle to be employed. No any other form of qualification is required before one is employed.

Other than drivers, there is another category of people employed commonly called 'turn boys' who in this context of study are referred to as labourers. These too have been trained on job. Only two people who were formerly employees of National Water and Sewerage Corporation were trained by NWSC.

There are two types of trucks that were identified i.e. the big trucks with a capacity of 4 m<sup>3</sup> and the small ones with a capacity of 2 m<sup>3</sup>. The volume of the draining activity depends on the size of the pits to be emptied and the type of truck used. In case the volume to be drained is higher than the capacity of the truck used, the truck makes another trip or several trips.

Apart from D & M General Merchants, sewage collection and disposal is the main activity carried out by these companies. Where there are other activities, they carried out under different names. Individuals who own these companies carry out these activities and the information regarding the details could not be easily ascertained.

Majority of the personnel has been employed for at least one year. Those with more than 10 years were former employees of NWSC.

## **7 0 FINANCIAL ANALYSIS**

The operators charge USh 30,000 for the 2-cubic metre and 50, 000 for the 4-cubic meter truck and the cost of fuel of USh 1,500 per litre. The discharge costs at the NWSC official dumping site are USh. 10,000 for a 4-cubic metre truck and USh. 5,000 for a 2-cubic metre truck.

The financial evaluation of the businesses of the various operators is attached as Annex 1: Cash Flow Analysis

## **8.0 INVESTIGATIONS INTO THE LEGAL DUMPING SITE**

The operational arrangements at the official dumpsite are as follows

- Kampala has only one legal dumping site at the Central Sewage Treatment Plant in Bugolobi is available.

- Dumping fees of 10,000/= per trip for 4 cubic meters of 5,000/= per trip of the small emptier of 1.8 cubic meters are currently in force.
- Payment is made at the NWSC cash office that is located about 2 kms from the dumping site. Dumping is only permitted upon presentation of an official NWSC receipt.
- Official opening hours is 8:00 a.m – 5:00 p.m inclusive Saturday and occasionally Sunday up to 3. 00 pm in the afternoon..
- Theoretically, dumping can be permitted without a receipt if the cash office is closed, say on Sundays. The operators are expected to bring the receipt later. However according to NWSC some operators never comply and therefore the scheme has been suspended.

Despite the complicated dumping procedures, there are no reported cases of indiscriminate dumping of sewage. Cases of non-compliance are rare except one case 2 years ago when a manhole in Kololo residential area that had become a dump site but NWSC positioned a guard at the location and the dumping stopped.

Two main factors appear to be responsible for the apparent high compliance rate. These are:

- ⇒ Public awareness campaigns by National Environment Management Authority (NEMA) that has made the Local Councils vigilant against unauthorised dumping of sewage. KCC Health Inspectors work with NWSC together with LCs to prevent indiscriminate dumping. NEMA also uses LCs to monitor environmental pollution control activities.
- ⇒ The NWSC has provided parking space for cesspool trucks near the dumping site. This acts to attract the cesspool drivers back to the site since this location is now known by customers. Hence since the drivers need to park at the sewage treatment site after each job then they find it convenient to use the official dumping site.

The cesspool drivers appear to be aware of the legal implications of unauthorized dumping although none reported having been arrested for the offence. NWSC do not have any records of unauthorized dumping although they have no mechanism or capacity to monitor the movements of the cesspool trucks in the city.

However operational records for the month of March indicate that a total of US\$ 1.6 million was collected in dumping fees by NWSC. This implies that 160 sewage loads were received in the month or 5 trips per day at rate of US\$ 10,000/= each. Given that 17 trucks are in operation and that March is the beginning of the wet season, this appears to be a very low figure. Indication is that dumping outside the official dumping site may still be continuing undetected or the operators have devised means of dumping at NWSC without following official procedures or both. TABLE 33 indicates the number of trips that were recorded by NWSC as received at the official dumping site for the months of February, March and April.

**TABLE 33 NUMBER OF TRIPS RECORDED BY NWSC**

<b>Month</b>	<b>Number of trips</b>
Feb-2002	51
Mar-2002	78
Apr-2002	63

Average	64
---------	----

NWSC also has a record of defaulters, those that have not paid dumping charges for some trips as indicated in TABLE 34 below.

**TABLE 34      DEFAULTERS**

<b>Name</b>	<b>Registration Number</b>	<b>Number of trips</b>
Badru Mukwaya	UAA 332T	1
Isima	UAB 490K	8
Tom Kipaku	UAB 815E	4
John Serubiri	UAA 914R	1
Senabulya	UAA 690U	3

The following companies are to be invoiced monthly by NWSC with effect from May 2002.

- |                   |                                   |
|-------------------|-----------------------------------|
| 1) Siraje Kiyimba | LG 0032-01 (Local Government KCC) |
| 2) Lwanga         | UP 0359 (Police)                  |
| 3) U.P.D.F        | H4 DF 090                         |
| 4) Kamyia         | UG 00745S                         |



## 9.0 REVIEW OF CONSTRAINTS.

### 9.0.1 NWSC Perspective

NWSC says there is too much grit and plastics in the sewage especially from pit latrines. This compels extra manpower for manually removing grit from the head works and sometimes leads to break down of the detritator. However it has been found that in fact most of the grit results from storm water infiltration and not from cesspool emptiers. NWSC recently installed manhole covers that are not airtight.

### 9.0.2 Operators' Perspective

#### *Discharge Charges High*

The discharge costs at the NWSC official dumping site are US\$ 10,000 for a 4-cubic metre truck and US\$ 5,000 for a 2-cubic metre truck. The operators consider these charges excessive in comparison to the amounts charged to customers of US\$ 30,000 for the 2-cubic metre and 50,000 for the 4-cubic metre truck and the cost of fuel of US\$ 1,500 per litre.

#### *Unauthorised Agency Operations Hurt Business*

The private trucks face unfair competition from unauthorised agency operations that are usually charged below market price since the latter do not face the operational costs that are borne by the former. The institutional trucks reported include the following;

- |                |   |       |
|----------------|---|-------|
| ○ Police       | - | 1 No. |
| ○ Army         | - | 2 No. |
| ○ PAPSCA / KCC | - | 1 No. |
| ○ NWSC         | - | 1 No. |
| ○ DWD          | - | 1 No. |

They pretend to be working on government premises when in effect they service private households. These public trucks charge customers less since the drivers have no operational costs and do not pay dumping fees.

#### *Complicated Business Approaches by NWSC*

The dumping site opens at 8:00 a.m. and closes at 5:00 p.m. yet business is obtained at any time before or after. Once the gate is closed, operators are forced to keep sewage loads on the truck overnight.

The dumping site does not usually open on Sundays. But even when it does, the truck operators are not allowed to dump without receipts and yet NWSC office that receives dumping fees and issues receipts does not open on Sundays. This can be a hindrance for business and encourages illegal dumping.

The whole process of obtaining a receipt is difficult and painful and mostly time wasting. Unlike in Dar es Salaam where operators pay monthly dumping fees, the ones in Kampala have to pay fees on a load by load basis. Sometimes the female cashiers refuse to handle money paid in by cesspool emptier drivers on account that the notes are unhygienic. So cesspool drivers are forced to cue up and wait for long periods of time as the ladies decide whether to handle the money or not. In the process they lose business to the public truck operators who need not pay cash prior to dumping.

NWSC demands payment of dumping fees on each load delivered yet majority of the consumers pay when work is finished. Usually one job converts to more than load.

#### 10.0 SUPPORT TO EMPTIERS OPERATORS BY NWSC.

- Parking area provided free. The site has now become the official location where customers come for services
- Dumping site provided so that operators do not engage in illegal dumping
- Plans are underway for NWSC to provide training to operators on safety operations and hygienic practices free of charge. The main areas of training will cover:
  - The use of correct gear.
  - Correct and safe handling of sewage at the household, in transportation and during dumping.
- Joint meetings with operators to iron out problems and differences are regularly held. The reduction of the dumping fees by 30% resulted from this type of dialogue. However according to some operators these meetings are no longer being held. .

#### Concerning Households.

The policy mechanism to support households in accessing safe sanitation and practice hygienic conduct is weak.

- Responsibility for sanitation is scattered in many institutions. KCC and Min of Health are responsible for on-site sanitation and yet the NWSC is responsible for sewerage.
- There is no IEC strategy for hygiene and health education. Crisis campaigns are usually mounted by the Ministry of Health during break-out of epidemics like cholera.
- Policy of charging for dumping is of little commercial value to NWSC yet the impact on households is quite tremendous. For example KCC used to provide subsidised cesspool emptying services to poor households at A charge that was to cover only cost of fuel. The imposition of dumping fees wiped out this subsidy thus locking the poor households out of the service altogether. Hence the imposition has a double negative effect:
  - On the poor
  - On the business of cesspool emptiers.
- Poverty reduces affordability by majority of customers. The private truck charges are between USh 40,000 and USh 60, 000 per trip. But for most households:
  - Affordability - 30,000/=
  - Willingness to pay - 25,000/=

**CASH FLOW FOR CESSPOOL EMPTYING COMPANIES****Parameters**

Working Year	250
Working Month	21
1 Trip	4 m <sup>3</sup> (Big truck)
1 Trip	2 trips of 2 m <sup>3</sup> (Small truck)

**For Mr. George  
Luhirika**

Item	Unit cost	Unit	Cost per year
<b>Income</b>			
Trip		2 per day	
Revenue	80,000	USh per day	40,000,000
<i>Sub Total</i>			<i>40,000,000</i>
<b>Expenditure</b>			
Fuel	40,000	per day	10,000,000
Dumping fees	10,000	per trip	5,000,000
Maintenance			1,500,000
Office rent			
Taxes			600,000
Insurance			80,000
Licence			
Labourer's payment	3,000	per day	750000
Driver's payment			
<i>Sub Total</i>			<i>17,930,000</i>
<b>Cash Flow</b>			
Income			40,000,000
Expenditure			17,930,000
			<b>22,070,000</b>

**For China Senyondo**

Item	Unit cost	Unit	Cost per year
Income			
Trip		1 per day	
Revenue	60,000	USh per day	15,000,000
<i>Sub Total</i>			<i>15,000,000</i>

Expenditure			
Fuel	40,000	per day	10,000,000
Dumping fees	10,000	per trip	2,500,000
Maintenance			480,000
Office rent	1,000	per day	250,000
Taxes			
Insurance			
Licence			
Labourer's payment			
Driver's payment			
<b>Sub Total</b>			<b>13,230,000</b>
Cash Flow			
Income			15,000,000
Expenditure			13,230,000
			<b>1,770,000</b>

### **For Sula Tamale**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	2	per day	
Revenue	30,000	USh per day	15,000,000
<b>Sub Total</b>			<b>15,000,000</b>
Expenditure			
Fuel	20,000	per day	5,000,000
Dumping fees	5,000	per trip	2,500,000
Maintenance			480,000
Office rent	1,000	per day	250,000
Taxes			
Insurance			
Licence			
Labourer's payment			
Driver's payment			
<b>Sub Total</b>			<b>8,230,000</b>
<b>Cash Flow</b>			
Income			15,000,000
Expenditure			8,230,000
			<b>6,770,000</b>

**For John Sselubiri**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	30,000	USh per day	7,500,000
<b>Sub Total</b>			<b>7,500,000</b>
Expenditure			
Fuel	5,000	per day	1,250,000
Dumping fees	10,000	per trip	2,500,000
Maintenance	90,000	per month	1,080,000
Office rent			
Taxes			300,000
Insurance			
Licence			
Labourer's payment	3,000	per day	750000
Driver's payment	7,000	per day	1750000
<b>Sub Total</b>			<b>7,630,000</b>
<b>Cash Flow</b>			
Income			7,500,000
Expenditure			7,630,000
			<b>(130,000)</b>

**For Abasi Kanyankole**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	70,000	USh per day	17,500,000
<b>Sub Total</b>			<b>17,500,000</b>
Expenditure			
Fuel	20,000	per day	5,000,000
Dumping fees	10,000	per trip	2,500,000
Maintenance	220,000	per 4 months	660,000
Office rent			
Taxes			300,000
Insurance			
Licence			
Labourer's payment			
Driver's payment	60,000	per day	3000000
<b>Sub Total</b>			<b>38,460,000</b>

<b>Cash Flow</b>			
Income			17,500,000
Expenditure			38,460,000
			<b>(20,960,000)</b>

**For Antony Senaburya**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	30,000	US\$ per day	7,500,000
<b>Sub Total</b>			<b>7,500,000</b>
Expenditure			
Fuel	6,500	per day	1,625,000
Dumping fees	10,000	per trip	2,500,000
Maintenance	70,000	per 4 months	210,000
Office rent			
Taxes			500,000
Insurance			
Licence			
Labourer's payment			
Driver's payment	170,000	per day	42,500,000
<b>Sub Total</b>			<b>47,335,000</b>
<b>Cash Flow</b>			
Income			7,500,000
Expenditure			47,335,000
			<b>(39,835,000)</b>

**For Joseph Kveyune**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	80,000	US\$ per day	20,000,000
<b>Sub Total</b>			<b>20,000,000</b>
Expenditure			
Fuel	15,000	per day	3,750,000
Dumping fees	10,000	per trip	2,500,000
Maintenance			
Office rent			
Taxes			
Insurance			
Licence			
Labourer's payment			

Driver's payment			
<b>Sub Total</b>			<b>6,250,000</b>
<b>Cash Flow</b>			
Income			20,000,000
Expenditure			6,250,000
			<b>13,750,000</b>

### **For Bob Aswimea**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	40,000	USh per day	10,000,000
<b>Sub Total</b>			<b>10,000,000</b>
Expenditure			
Fuel	20,000	per day	5,000,000
Dumping fees	10,000	per trip	2,500,000
Maintenance			210,000
Office rent	1,000	per day	250,000
Taxes			
Insurance			
Licence			
Labourer's payment	15,000	per month	180,000
Driver's payment	60,000	per month	720,000
<b>Sub Total</b>			<b>8,860,000</b>
<b>Cash Flow</b>			
Income			10,000,000
Expenditure			8,860,000
			<b>1,140,000</b>

### **For Tom Ssokweri**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	25,000	USh per day	6,250,000
<b>Sub Total</b>			<b>6,250,000</b>
Expenditure			
Fuel	10,000	per day	2,500,000
Dumping fees	5,000	per trip	1,250,000
Maintenance			3,750,000
Office rent	2,000	per day	500,000

Taxes			
Insurance			
Licence			
Labourer's payment			
Driver's payment	20,000	per month	240000
<b>Sub Total</b>			<b>8,240,000</b>
<b>Cash Flow</b>			
Income			6,250,000
Expenditure			8,240,000
			<b>(1,990,000)</b>

### **For Rashid Nsubuga**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	40,000	USh per day	10,000,000
<b>Sub Total</b>			<b>10,000,000</b>
Expenditure			
Fuel	15,000	per day	3,750,000
Dumping fees	10,000	per trip	2,500,000
Maintenance			
Office rent	2,000	per day	500,000
Taxes			
Insurance			
Licence			
Labourer's payment	25,000	per month	300,000
Driver's payment	80,000	per month	960,000
<b>Sub Total</b>			<b>8,010,000</b>
<b>Cash Flow</b>			
Income			10,000,000
Expenditure			8,010,000
			<b>1,990,000</b>

### **Names Withheld**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	60,000	USh per day	15,000,000
<b>Sub Total</b>			<b>15,000,000</b>



Expenditure			
Fuel	15,000	per day	3,750,000
Dumping fees	10,000	per trip	2,500,000
Maintenance	90,000	Every 2 months	540,000
Office rent	1,000	per day	250,000
Taxes			
Insurance			
Licence			
Labourer's payment			
Driver's payment			
<b>Sub Total</b>			<b>7,040,000</b>
<b>Cash Flow</b>			
Income			15,000,000
Expenditure			7,040,000
			<b>7,960,000</b>

**For Emmanuel Mikando**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	30,000	US\$ per day	7,500,000
<b>Sub Total</b>			<b>7,500,000</b>
Expenditure			
Fuel	10,000	per day	2,500,000
Dumping fees	5,000	per trip	1,250,000
Maintenance			320,000
Office rent	10,000	per day	30,000
Taxes			411,500
Insurance			
Licence			
Labourer's payment			
Driver's payment			
<b>Sub Total</b>			<b>4,511,500</b>
<b>Cash Flow</b>			
Income			7,500,000
Expenditure			4,511,500
			<b>2,988,500</b>

**For Bernard Kizito**

<b>Item</b>	<b>Unit cost</b>	<b>Unit</b>	<b>Cost per year</b>
Income			
Trip	1	per day	
Revenue	30,000	USh per day	7,500,000
<b><i>Sub Total</i></b>			<b><i>7,500,000</i></b>
Expenditure			
Fuel	6,500	per day	1,625,000
Dumping fees	5,000	per trip	1,250,000
Maintenance			
Office rent	1,000	per day	250,000
Taxes			
Insurance			
Licence			
Labourer's payment			
Driver's payment			
<b><i>Sub Total</i></b>			<b><i>3,125,000</i></b>
<b>Cash Flow</b>			
Income			7,500,000
Expenditure			3,125,000
			<b>4,375,000</b>