Chapter 2

MMC SWM System – Additional Details

Contents

Page:

List of Tables

List of Figures

Chapter 2 MMC SWM System – Additional Details

This section provides supplementary information to that in the main report concerning different aspects of MMC's SWM system. The majority of this data was collected during May – July 2002, with essential items having been updated since then, as stated in the text.

2.1 Waste Management Equipment – Detailed Data

Table 2-1: Waste Management Vehicle Fleet and Supporting Equipment

Vehicles/ equipment	No	Use	Regis-tration No	Date of Registration	Cost	Estimated lifetime (yrs)
Handcarts (0.40m^3)	15	waste collection, road/drain cleaning	N/a	N/a	11,000 (current)	2 yrs
Two wheel tractor (Kubota 75) (2.4m^3)	1	Waste collection	75-1798	1991	145,000	8 yrs
Four wheel tractors (4WT) (MF240)	3	2 – waste collection; 1 – Works Dept	37-9103 49-9957 49-6824	1995 1998 Not known	600,000 865,000 Not known	8 yrs
4WT Trailers (6.6m^3)	4	1 – waste collection; 3 – out of service	44-7172	Not known	120,000	5-10 yrs
Used Compactors	2	waste collection: Large (7.5m^3) Small (3.7m^3)	 227-6727 GI-1602	 1999 (1981) 2000 (1994)	 800,000 450,000	3-6 yrs
Gully suckers (1 x 7,000 L) (1 x 5,000 L)	2	Septic tank/public toilets emptying	 42-7553 GI-9337	 1991 2002	 2,000,000 4,500,000	5-10 yrs

Notes:

1. Handcart internal dimensions are 4ft x 2.5ft x 1.4ft (1.22m x 0.76m x 0.43m)). MMC actually has 20 handcarts but five are out of service. The estimated handcart lifetime is relatively low, as after about two years the wheels need replacing and rusting of the frame is becoming a problem. MMC prefers to buy new handcarts at this stage rather than repairing an existing handcart.
2. Two wheel tractor trailer dimensions are 1.60m long x 1.05m wide x 1.45m high. This is not currently being used (Sep 2003).
3. Tractor lifetime was estimated based on one of the existing tractors (37-9103; 7 yrs old) being in poor running condition.
4. 4WT trailer dimensions are 3.0m long x 1.8m wide x 1.22m high. Trailers are cleaned daily but not washed. They show signs of rust after only one year of operation and are periodically patched after this time at an approximate cost of around 20,000 Rs/yr (mainly welding). This means they can be maintained in a reasonable-good condition for at least 5 years, after which time their remaining service life is variable, but may be as long as a further 3-5 years if looked after well.
5. Compactors were donated to MMC as used vehicles. Stated capacities are based on internal dimensions measured by JICA. Estimated compactor lifetimes were less certain. The Transport Officer expects these vehicles will require a major overhaul after about three years of service, following which they should be able to be used for another three years.
6. A new gully sucker (5,000 L) capacity was recently obtained from ADB in May 2002. This has yet to be used (as of July 2002).
7. Two MMC Isuzu lorries were temporarily used for garbage collection from Dec 2001-April/May 2002, as both compactors were out of service for most of this time. Lorry use for garbage collection is not favoured by labourers as the lorries are more difficult to load than tractors (greater lifting height), while they must be unloaded manually at the final disposal site.

2.2 IDP Programmes and Gully Sucker Fees – Additional Data

The following table summarises the number of IDP programmes conducted each month during 2001 and monthly gully sucker trips and revenue during 2001.

Table 2-2: IDP Programmes and Gully Sucker Trips/Income during 2001

Month (2001)	IDP Cleaning Programmes	Number of Gully Sucker Trips (septic tanks and public toilets emptying)			Gully sucker income (Rs/mth)
		Resident + business	Public toilets	Total	
January	22	20	0	20	25,350
February	24	37	1	38	66,900
March	40	25	1	26	32,750
April	35	20	1	21	25,700
May	33	27	0	27	55,050
June	41	16	0	16	38,400
July	35	21	0	21	48,450
August	27	30	1	31	35,950
September	20	17	1	18	45,250
October	25	20	0	20	36,700
November	25	26	0	26	45,650
December	15	31	0	31	51,400
Total	342	290	5	295	507,550
Average	29	24	0.4	25	42,300

Gully sucker fees are tabulated below.

Table 2-3: Gully Sucker Collection Charges

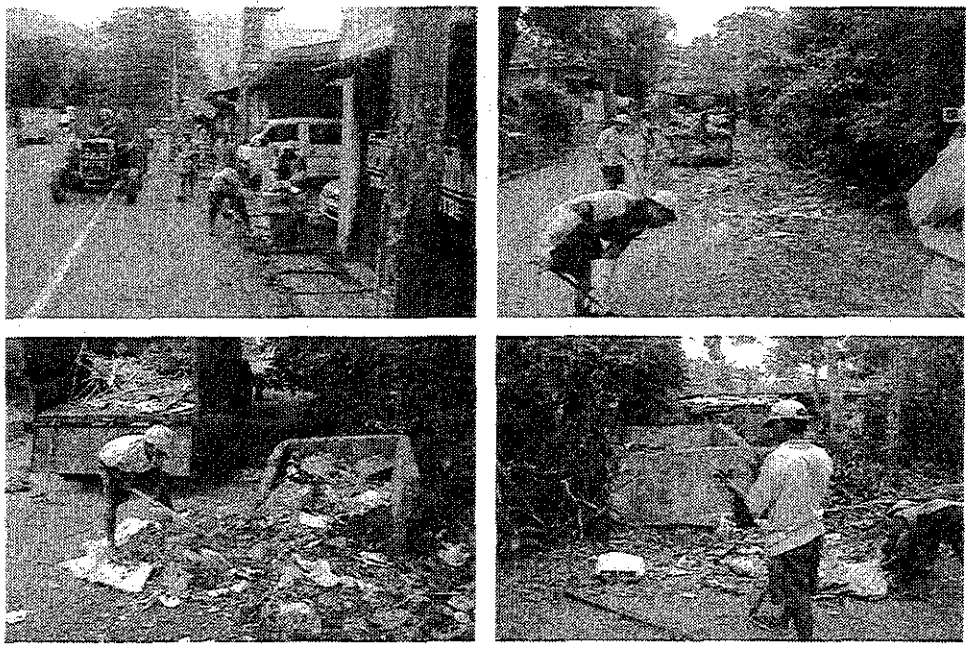
Gully sucker charges	Location	Residential	Business and government	Religious
Gully sucker (7,000 L)	Within MMC limits	1,250	2,500	Free
	Outside MMC limits	3,000 + 100 Rs/km + 200 Rs inspection cost		Free

Notes:

1. These rates were set in December 2000 and apply to private septic tanks/latrines. They exclude tax.
2. Very poor residents are charged a nominal fee of 100 Rs per household.
3. For services provided outside the city limits, an additional 200 Rs inspection fee is charged, covering the travel costs of an Overseer for inspection of the septic tank/pit latrine prior to emptying.
4. When the septic tank/latrine requires more than one load to empty, 500Rs is charged for the 2nd load.
5. Charges for the new 5,000L gully sucker are to be the same as for the 7,000L gully sucker.

2.3 SWM Discharge/Collection – Additional Information

2.3.1 Sample Photos of the Garbage Discharge and Collection System



2.3.2 Garbage Collection Daily Routine

All refuse collection vehicles are parked near the MMC Council buildings overnight, while handcarts are generally parked near their working areas. Each morning, labourers must punch their attendance cards ("clock in") and then report to the office where the roll is taken around 7:30am. They must also clock out at the end of each day (working day = 8h).

Diesel is kept in the MMC Supply Shed. Drivers must order diesel from the Engineer, typically once every 3-4 days, while all vehicles must record their trips in a standard book, including a written description, start and finish odometer readings, trip distance (km), time in/out and fuel orders. These records must be signed by both the Transport Officer and Engineer.

2.3.3 Time and Motion Data

MMC tractor/compactor time and motion study results from June 2002 are tabulated below.

Table 2-4: Time and Motion Study Summary

Item	Four Wheel Tractor	Large Compactor
Start Time	07:50	07:53
Time for first collection round	2h 30min	2h 7min
Travel to landfill	15 min	14min
Unloading at landfill	10 min	2 min
Total loading time	1h 55min	1h 40min 5s
Total time (excluding unloading)	3h 10min	2h 37min
Loading time (% of total time)	61%	64%

2.3.4 MMC Collection Vehicle Unit Costs

MMC garbage collection vehicle unit costs were calculated for handcarts, tractors and compactors using actual cost data supplied by MMC, supplemented by information from other sources where necessary. These costs are tabulated below.

Table 2-5: MMC Collection Vehicle Unit Costs

Item	Handcart	Two Wheel Tractor	Four Wheel Tractor	Small Compactor (3.7 m^3)	Large Compactor (7.5m^3)
No of labourers	1	2	4	4	4
Driver	0	78,612	78,612	84,612	84,612
Labourers	72,612	145,224	290,448	290,448	290,448
Staff equipment	250	500	3,000	3,000	3,000
Diesel	0	22,320	83,700	148,800	186,000
Oil	0	1,200	11,040	10,320	12,720
Tyres, tubes	2,000	19,800	54,240	30,000	30,840
Vehicle repair/maintenance	500	6,000	18,000	24,000	24,000
Trailer repair	0	0	10,000	0	0
Insurance	0	1,974	1,811	16,321	16,321
Licence/ registration	0	150	150	2,800	2,825
Depreciation	2,750	8,286	48,524	56,250	100,000
Total (Rs/yr)	**78,112**	**284,066**	**599,525**	**666,551**	**750,766**
Average trips/ vehicle.d	4.0	1.9	2.0	1.8	2.1
Collection (T/vehicle.yr)	156	264	1,489	1,478	2,825
Unit cost (Rs/T)	**501**	**1,077**	**403**	**451**	**266**
Comparative unit costs					
Kandy MC (Aug 2002)	1,342-1,983 (2-3Lr, 3.2trips/d)	N/a	496	707	N/a
Negombo MC (Aug 02)	1,320-792 (3Lr, 3-5 trips/d)	N/a	418 (3Lr)	N/a	N/a
Chilaw UC (Aug 02)	1,322-749 (3Lr, 2.8-5trips/d)	698 (2Lr)	629 (3Lr)	N/a	N/a
Gampaha MC (Aug 02)	1,482-2,185 (2-3Lr, 3trips/d)	764 (2Lr)	799 (4Lr)	N/a	N/a
Nuwara Eliya MC (Sep 02)	1,858-1,115 (3Lr, 3-5trips/d)	N/a	517 (3Lr)	447 (3Lr)	N/a
Badulla MC (Sep 02)	1,865-1,119 (3Lr, 3-5trips/d)	822 (2Lr)	268-254 (3Lr)	390 (3Lr)	N/a

Notes:
1. Handcart garbage collection tonnage data based on 3 handcarts working in the area serviced by the large compactor doing a total of 12 trips/d.
2. Four wheel tractor costs are average values for the two four wheel tractors.
3. Depreciation has been included here, using data provided by MMC.
4. Galle MC, Colombo MC and Abans unit costs were obtained in January 2002. All other unit costs were obtained between Jun-Sep 2002.
5. Under comparative costs, Lr indicates the number of labourers for each vehicle.

2.4 Final Disposal

2.4.1 Kaludewala Landfill

This section describes the conditions at the Kaludewala disposal site, which was used by MMC for final disposal of Matale's waste until late 2002. Some of the comments (e.g. opening hours, vehicle register, etc.) can be expected to apply to the new disposal site.

2.4.2 General Condition during Operation

The final disposal site at Kaludewala is situated on the banks of the Sudu Ganga (Sudu River), just outside MMA, approximately 2km from the city centre. Operating hours were from 7:30am – 3:00pm,

although one MMC tractor did dump waste during the night time. There was no permanent Landfill Supervisor. Instead, the SWM Supervisor looking after this area had overall responsibility for management of the landfill. Five labourers worked at the landfill site during the day only. They were provided with gumboots and gloves but these were not very durable, with the gloves tearing easily. Details of each incoming vehicle were recorded in a Register, which listed the vehicle registration, time in, time out, number of loads, and the driver's signature. Night-time loads were recorded in a separate book by the night-time tractor crew leader. These record books had to be signed every 2-3 days by the MMC Engineer.

Compactor truck waste was received at the western end of the landfill. An ~0.6ha platform was created here and compactors simply dumped their load within this area. After 1-2 months, when this area was nearly full, MMC hired a bulldozer for a day to push the waste to the sides, creating large mounds around the perimeter of this area and re-establishing the platform for ongoing use by the compactors.

Tractor waste was dumped at the eastern end of the landfill, being tipped off the edge of a flat area, cascading down towards the river. Labourers assisted in pushing the waste down this slope and in burning the waste deposited here and in the compactor area.

Meat and fish waste from the central city area, including the city's markets was dumped in a small area between these two sections, near the river bank. Gully sucker waste was also discharged near this area.

No private loads were officially received at the landfill, although some illegal dumping is believed to have occurred during the night (e.g. one sawmill said it disposed some sawdust and woodchips to this disposal site).

Vehicle unloading times, including for signing of the Register, are shown in Table 2-6.

Table 2-6: Garbage Collection Vehicle Unloading Times

Vehicle	Unloading time	Source
Compactor	2-4 min	2 min measured during time and motion study; 4 min estimated.
Four wheel tractor	10 - 15 min	10 min measured during time and motion study, 15 min from Landfill Register "time in/out" data.
Two wheel tractor	15 - 30 min	Landfill Register "time in/out" data.
Large lorry	20 - 45 min	Labourers' comments (only used in emergency).

2.4.3 General Condition on Closure

Dumping was simply terminated at the landfill following strong public protests, without any environmental protection measures being taken to properly close the landfill. Since then, vegetation is rapidly covering the landfill, so that most of the visual and nuisance related negative impacts should decrease. However, longer term negative impacts, especially associated with leachate and landfill gas generation can be expected to continue for some years.

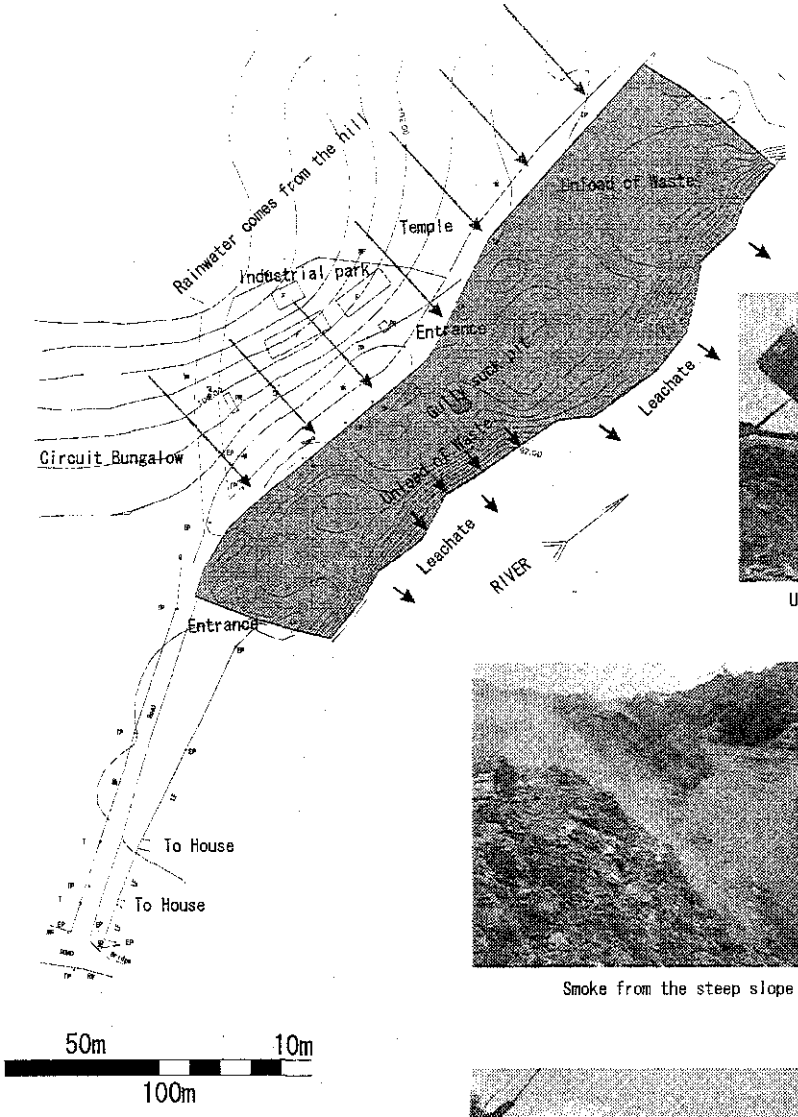
2.4.4 Landfill Survey Results

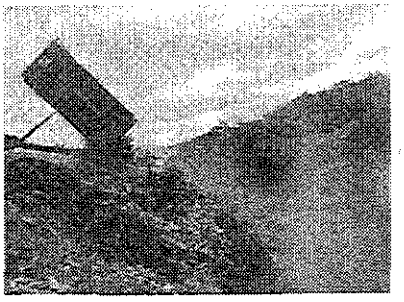
The results of a comprehensive survey of the landfill site and its surrounds conducted in July 2002 are summarised below.

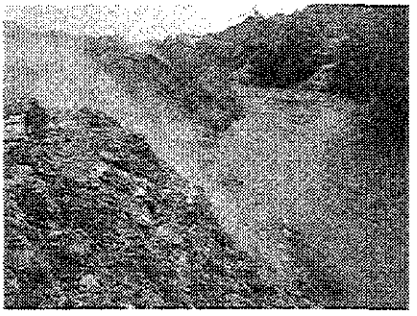
Table 2-7 : Kaludewala Landfill Survey Results

Item		Description			
1. Name		Kaludewala disposal site			
2. Location		Kaludewala, on the banks of the Sudu Ganga, approximately 2km from Matale citry centre.			
3. Start of filling operations		1963			
4. Land Ownership		Matale Municipal Council			
5. General Site Description		Located on the banks of the Sudu Ganga in a steep valley.			
6.Surrounding land use		Residential, industrial park			
7. Area	Current site	Approx. 1.5 ha			
8. Disposal site	Disposal method	Open dumping			
	Reserve volume	Approx 7,000m^3			
9. Waste discharge	Municipal waste	MSW collected by MMC and brought for disposal; Daily average: 19.6tonnes/d (235 tonnes/month)			
	Healthcare hazardous waste	Mainly disposed of on-site by medical institutions themselves; daily average = 7.6kg/d (228kg/month)			
	Industrial waste	Main discharge sources: - Diana Chocolate factory (20kg/d): normal garbage collected by MMC - Sawmills: 1.83T/d of sawdust, woodchips mainly given away or burnt on-site; about 0.25T/d may be directly hauled to landfill (not independently verified).			
	Gully sucker waste	Collected by MMC and discharged into a pit at the landfill site; monthly average: 175m^3/month (25 trips/month of 7,000m^3 gully sucker).			
10. Environmental impact	Odour	Seriously affects surrounding villages throughout the year due to lack of proper soil cover.			
	Flies & crows	Seriously affects surrounding villages throughout the year due to lack of proper soil cover.			
	Fire & smoke	Seriously affects surrounding villages during the dry season due to lack of proper soil cover.			
	Leachate	Rainfall on the landfill site and on the hill above the site readily infiltrates the deposited waste due to lack of soil cover, producing large volumes of leachate which flow directly into the Sudu Ganga without any treatment.			
	Gully sucker waste	Discharged into pit (2m dia., 2m depth excavated every three months) and soaks into the soil, percolating through it to the Sudu Ganga.			
11. Facilities	General	No control house, gate, boundary fence, buffer zone or weighbridge			
	Leachate treatment	None			
	Electricity supply	There is an electricity supply on the road next to the landfill site.			
	Water supply	There is a water supply on the road next to the landfill site.			
	Telephone line	none			
12. Operation and Maintenance	Responsible organization	Matale Municipal Council			
	Equipment	Backhoe Loader (JCB 3CX Sideshift): 1 unit, owned by MMC; used in general excavation works and also for loading cover soil and occasionally for excavating pits for the disposal of gully sucker waste.			
	Staff allocation	Position	No of Workers	Duty	Working hours
		Supervisor	1	Supervision	8:00-16:00
		Labourer	5	Waste unloading	8:00-16:00
	Staff Salaries	Supervisor: 6,000Rs/month			
		Labourer: 4,500Rs/month			

Item		Description
13. Surrounding villages or facilities	Parawatta	Landfill site is located at the start of the village access road. About 527 households seem to be affected by the landfill (mainly low income houses, including 18 people working as MMC labourers). Nearly 75% of villagers use the Sudu Ganga downstream of the landfill for bathing and washing.
	Kaludewala	About 40 households affected by the landfill site, including low, middle and high income families. Most of them are affected only by smoke and flies.




Unloading of waste to the river


Smoke from the steep slope

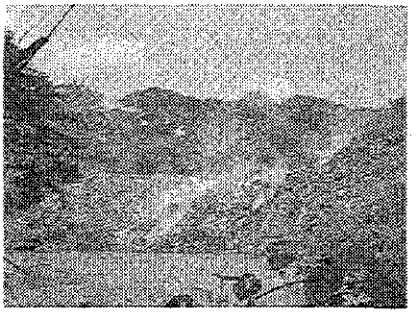

Smoke from the steep slope

Figure 2-1: Kaludewala Landfill Site

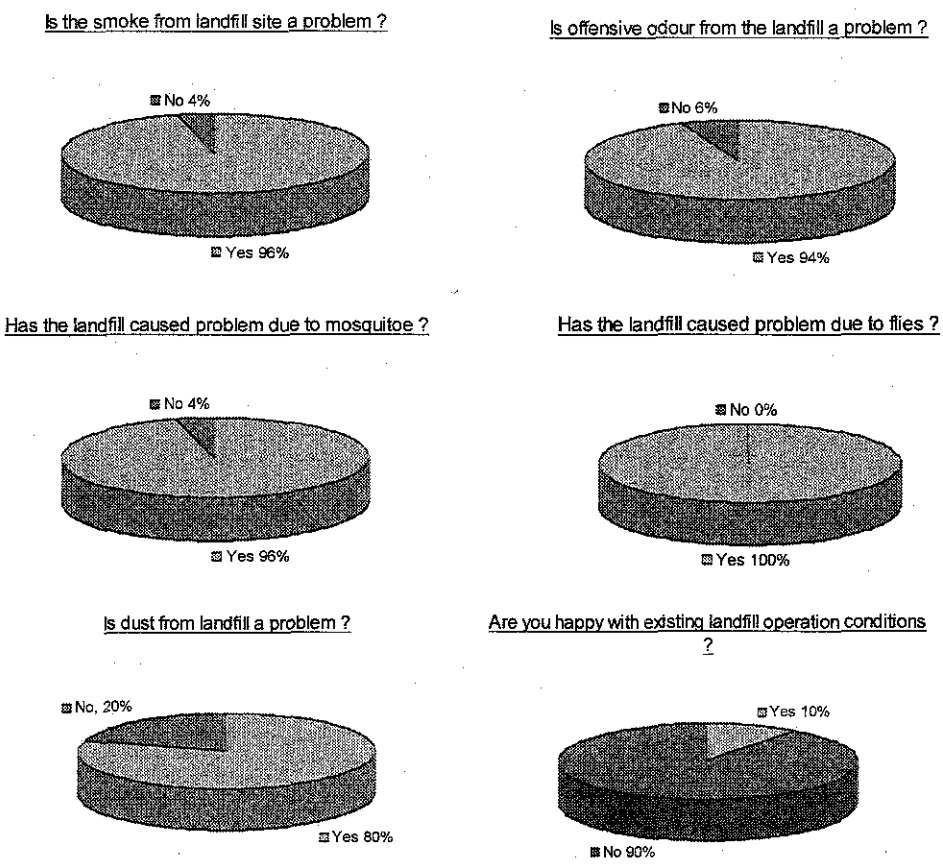
2.4.5 Issues at the Kaludewala landfill site

2.4.5.1 Remaining Lifetime

It is impossible to expand the Kaludewala landfill site any more because MMC has discharged waste up to the boundary of the landfill site on all sides. However, as of late 2002, MMC had not undertaken any studies to find a new landfill site to replace the Kaludewala landfill. Therefore, MMC must look for a new landfill site as soon as possible while taking measures to temporarily expand the lifetime of the Kaludewala landfill.

2.4.5.2 Odour, Pests, Crows, and Smoke

According to the interview survey carried out in villages surrounding the Kaludewala landfill site in July 2002, odour, pests, crows, and smoke (from burning garbage) are having a serious impact on the residents of these villages, as summarised below. The major cause of these problems is inadequate covering of the deposited waste with soil. Therefore, MMC must cover the waste at the landfill site with soil more regularly in order to mitigate these negative impacts on nearby residents.



2.4.5.3 Leachate

Rainwater readily penetrates the deposited waste at the landfill site, both directly and as stormwater runoff from the hill to the west of the site, due to a lack of proper cover soil. This results in large volumes of leachate being generated, with the leachate flowing directly into the Sudu Ganga without any treatment, which may cause a negative environmental impact on the area downstream of the landfill site.

2.4.5.4 Gully Sucker Waste

Gully sucker waste is discharged every day without any treatment into pits, which are excavated by machine at the landfill site. As for leachate, the gully sucker waste water soaks into the ground, percolating through it to the Sudu Ganga, which may have a significant negative environmental impact on the area downstream of the landfill site.

2.4.5.5 Operation and Maintenance (O&M)

Current landfill O&M methods and corresponding issues are summarised below.

- Tractors often discharge their loads down the steep slope adjoining the Sudu Ganga, resulting in garbage falling into the river and flowing downstream.
- MMC staff often burn the waste at the landfill site in order to reduce the volume of waste and mitigate against odour and pests. However, this practice generates a lot of smoke, which has a serious impact on nearby residents.
- MMC covers deposited waste at the landfill site with soil irregularly, generally only when soil generated by construction works in the city is obtained.

Chapter 3

Matale Field Surveys

Contents

Page:

List of Tables

Chapter 3 Filed Survey

3.1 Public Opinion Survey for household

Findings from Public Opinion Survey for Household in Matale

A questionnaire survey was conducted among 120 households in Matale Municipal Areas, in order to gather;

- Basic socio-economic profiles of inhabitants of Matale.
- An appreciation of public attitude to the provision of solid waste collection services.
- An appreciation of desired improvement in solid waste management services.
- An indication of willingness to pay for improved solid waste collection services.

Period of survey: Third and forth weeks of June and first week of July, 2002
Sample size: 120 (40 each from high, middle and low income areas)
Sampling areas: *High income areas are Viduhal Place (Park lane area) and Malwatte
*Middle income areas are Katuwegedara and Dole pale (Gongawela area)
*Low income areas are Higgolla and Mahadevata

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1. General Questions

Q1-1 Ethnicity

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Sinhala	17	43%	21	53%	29	73%	67	56%
2	Muslim	2	5%	19	48%	11	28%	32	27%
3	Tamil	21	53%	0	0%	0	0%	21	18%
4	Other	0	0%	0	0%	0	0%	0	0%
	Total	40	100%	40	100%	40	100%	120	100%

Q1-2 Religion

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Buddhist	17	43%	21	53%	28	70%	66	55%
2	Islam	1	3%	19	48%	11	28%	31	26%
3	Hindu	20	50%	0	0%	0	0%	20	17%
4	Christian	2	5%	0	0%	0	0%	2	2%
5	Other	0	0%	0	0%	1	3%	1	1%
	Total	40	100%	40	100%	40	100%	120	100%

Q1-3 Household information

(person)	Low	Middle	High	Total
Avg. number of household members	5.4	5.5	5.6	5.5

(Rs.)	Low	Middle	High	Total
Avg. household income	5,733	12,833	36,330	18,298

(Rs.)	Low	Middle	High	Total
Income per person	1,062	2,323	6,546	3,332

Q1-4 How much is the total expenditure of your household per month on average?

(Rs.)	Low	Middle	High	Total
Avg. household expenditure	5,231	8,563	14,900	9,565

(Rs.)	Low	Middle	High	Total
Expenditure per person	969	1,550	2,685	1,742

Q1-5 Please specify the priority for your daily life regarding the improvement of the following aspects ? (Fill all three priorities)

		Low	Middle	High	Total
1	First	Waste water collection	Garbage collection	Garbage collection	Garbage collection
2	Second	Storm water drainage	Water supply	Waste water collection	Waste water collection
3	Third	Access road to house	Waste water collection	Storm water drainage	Storm water drainage

2. Questions on Garbage Collection Services in Your Area

Q2-1 Are there garbage collection services in your area?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	40	100%	40	100%	40	100%	120	100%
2	No	0	0%	0	0%	0	0%	0	0%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-2 Do you use these services?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	39	98%	34	85%	34	85%	107	89%
2	No	1	3%	6	15%	6	15%	13	11%
99	Irrelevant	0	0%	0	0%	0	0%	0	0%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-3 How is your garbage collected?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Placing garbage outside the property for collection	17	43%	23	58%	30	75%	70	58%
2	Carrying garbage to a specified collection point	22	55%	10	25%	1	3%	33	28%
3	Carrying garbage to a collection truck directly	0	0%	1	3%	3	8%	4	3%
4	Others	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-4 How often is your garbage collected?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Daily	23	58%	14	35%	29	73%	66	55%
2	More than four times per week	14	35%	6	15%	5	13%	25	21%
3	Two to three times per week	0	0%	6	15%	0	0%	6	5%
4	Once a week	0	0%	0	0%	0	0%	0	0%
5	Less than once per week	0	0%	0	0%	0	0%	0	0%
6	Irregular	2	5%	8	20%	0	0%	10	8%
98	Don't know	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-5 Is the garbage collection service done at a fixed time on the collection day?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	28	70%	15	38%	27	68%	70	58%
2	No	11	28%	18	45%	7	18%	36	30%
98	Don't know	0	0%	1	3%	0	0%	1	1%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-6 Have you ever given small allowance such as new year's allowance and other seasonal allowance, including the reward to the extra work for you, to garbage collectors?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	3	8%	19	48%	19	48%	41	34%
2	No	36	90%	15	38%	15	38%	66	55%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-7 How much is the total amount of (1) small allowance and (2) the reward you gave over the last one year?

(1) Small allowance

(Rs.)	Low	Middle	High	Total
Average annual small allowance	50	48	143	94

Note: No. of effective answers on this question is 31.

(2) Reward

(Rs.)	Low	Middle	High	Total
Average annual reward	35	47	154	90

Note: No. of effective answers on this question is 12.

Q2-8 Are you satisfied with the collection service?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	*Very satisfied*	12	30%	9	23%	18	45%	39	33%
2	Somewhat satisfied	20	50%	12	30%	15	38%	47	39%
3	Less than satisfied	7	18%	12	30%	1	3%	20	17%
4	Not satisfied at all	0	0%	1	3%	0	0%	1	1%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-9 If you chose either 2, 3 or 4, what are the reasons? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Garbage collection / sweeping is not properly done	20	29%	18	24%	12	22%	50	25%
2	Garbage collection / sweeping frequency is too low	11	16%	18	24%	8	15%	37	19%
3	Garbage collection / sweeping is irregular	6	9%	13	17%	7	13%	26	13%
4	Garbage collection time is too early or to late or irregular	6	9%	2	3%	0	0%	8	4%
5	Behavior of garbage collection workers is bad	2	3%	0	0%	0	0%	2	1%
6	Garbage collection workers demand small allowance	0	0%	1	1%	4	7%	5	3%
7	Garbage collection small allowance is expensive	0	0%	0	0%	0	0%	0	0%
8	Collection service is not fair	1	1%	0	0%	0	0%	1	1%
9	*Garbage collection point is too far*	7	10%	6	8%	0	0%	13	7%
10	Other	2	3%	3	4%	0	0%	5	3%
99	Irrelevant	13	19%	15	20%	24	44%	52	26%
	Total	68	100%	76	100%	55	100%	199	100%

Note: Other means "the present bin system is not workable due to mal-design. " and " Not enough supervision towards workers."

Q2-10 Have you ever complained about the garbage collection service to the authorities in the last three years?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	4	10%	6	15%	5	13%	15	13%
2	No	35	88%	28	70%	29	73%	92	77%
99	Irrelevant	1	3%	6	15%	6	15%	13	11%
	Total	40	100%	40	100%	40	100%	120	100%

Q2-11 ***(Only for persons who chose "NO" in question Q2-1)*** Do you want to receive a garbage collection service?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	0	0%	0	0%	0	0%	0	0%
2	No	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	40	100%	40	100%	40	100%	120	100%
	Total	40	100%	40	100%	40	100%	120	100%

3. Questions on Waste Discharge from Your Premises

Q3-1 How do you dispose of garbage generated in your premises?

		Low		Middle		High		Total	
		Main	Other	Main	Other	Main	Other	Main	Other
1	Discharge it outside of the house for the house to house collection	16	1	23	1	29	0	68	2
2	Discharge it at the specified place for the collection service	22	0	7	1	1	0	30	1
3	Open dumping outside of the house	1	0	0	3	1	1	2	4
4	Ask the relevant authority to send garbage collectors	0	0	0	0	0	0	0	0
5	Self-dispose	1	3	7	13	7	9	15	25
6	Composting (producing fertilizer from waste)	0	0	2	0	1	5	3	5
7	Give for recycling	0	0	0	0	0	0	0	0
8	Other	0	0	1	1	1	2	2	3
	Total	40	4	40	19	40	17	120	40

		Low		Middle		High		Total	
		Main	Other	Main	Other	Main	Other	Main	Other
1	Discharge it outside of the house for the house to house collection	40%	25%	58%	5%	73%	0%	57%	5%
2	Discharge it at the specified place for the collection service	55%	0%	18%	5%	3%	0%	25%	3%
3	Open dumping outside of the house	3%	0%	0%	16%	3%	6%	2%	10%
4	Ask the relevant authority to send garbage collectors	0%	0%	0%	0%	0%	0%	0%	0%
5	Self-dispose	3%	75%	18%	68%	18%	53%	13%	63%
6	Composting (producing fertilizer from waste)	0%	0%	5%	0%	3%	29%	3%	13%
7	Give for recycling	0%	0%	0%	0%	0%	0%	0%	0%
8	Other	0%	0%	3%	5%	3%	12%	2%	8%
	Total	100%	100%	100%	100%	100%	100%	100%	100%

Note: Other means "place them directly to either collection truck or hand cart."

Q3-2 How often do you dispose of garbage generated in your premises?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	As soon as waste arises	1	3%	3	8%	1	3%	5	4%
2	Once daily	26	65%	20	50%	31	78%	77	64%
3	Once every 2 or 3 days	13	33%	10	25%	7	18%	30	25%
4	Less frequently	0	0%	7	18%	1	3%	8	7%
	Total	40	100%	40	100%	40	100%	120	100%

Q3-3 Who mainly handles wastes at home?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	An adult male member	2	5%	2	5%	2	5%	6	5%
2	An adult female member	38	95%	33	83%	24	60%	95	79%
3	Servant	0	0%	4	10%	12	30%	16	13%
4	Others	0	0%	1	3%	2	5%	3	3%
	Total	40	100%	40	100%	40	100%	120	100%

Note: Other means "anyone in the family".

Q3-4 ***(Only for persons who chose 2 in question Q3-1)*** Who mainly brings the wastes to a specific collection point?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	An adult male member	2	5%	2	5%	0	0%	4	3%
2	An adult female member	20	50%	5	13%	1	3%	26	22%
3	Child	0	0%	0	0%	0	0%	0	0%
4	Servant	0	0%	0	0%	0	0%	0	0%
5	Others	0	0%	1	3%	0	0%	1	1%
99	Irrelevant	18	45%	32	80%	39	98%	89	74%
	Total	40	100%	40	100%	40	100%	120	100%

Note: Other means "anyone in the family".

Q3-5 What type of container do you use for carrying garbage to a collection point or for placing the garbage outside of your house? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Plastic bag	34	63%	29	46%	29	55%	92	54%
2	Paper bag	0	0%	1	2%	0	0%	1	1%
3	Metal/plastic/wood garbage bin	9	17%	20	32%	16	30%	45	26%
4	Box	0	0%	1	2%	0	0%	1	1%
5	Basket	3	6%	3	5%	3	6%	9	5%
6	None-place directly	6	11%	6	10%	3	6%	14	8%
7	Others	2	4%	3	5%	2	4%	8	5%
	Total	54	100%	63	100%	53	100%	170	100%

Note : Other means nylon bags of fertilizer, called pohora bag.

Q3-6 Why do you use it? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	It is clean after collection work	12	17%	19	24%	23	30%	54	24%
2	It prevents foul odors	2	3%	7	9%	4	5%	13	6%
3	It is easy handling	34	47%	34	43%	33	43%	101	44%
4	It keeps away pests such as flies	1	1%	3	4%	4	5%	8	4%
5	It is cheap or easy to get	20	28%	11	14%	7	9%	38	17%
6	Other	3	4%	5	6%	5	7%	13	6%
	Total	72	100%	79	100%	76	100%	227	100%

Note : Other means "it will be thrown away anyway" , "durable" and " prevent scattering."

Q3-7 ***(Only for those who did not choose 2 in Q3-1)*** If you are requested to carry your garbage to a specified garbage collection point, would you cooperate to do so?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes, if it is located within 25m distance (30 sec to walk)	7	18%	18	45%	26	65%	51	43%
2	Yes, if it is located within 50m distance (1 min to walk)	3	8%	1	3%	0	0%	4	3%
3	No, I do not prefer the collection system mentioned above anyway	7	18%	11	28%	11	28%	29	24%
4	Others	1	3%	1	3%	2	5%	4	3%
98	Don't know	0	0%	1	3%	0	0%	1	1%
99	Irrelevant	22	55%	8	20%	1	3%	31	26%
	Total	40	100%	40	100%	40	100%	120	100%

Note: Other means "yes, only if it is located within 10 to 15 meters distance."

Q3-8 Do you have garden wastes (fallen leafs and branches or grass and weeds)?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	12	30%	22	55%	29	73%	63	53%
2	No	28	70%	18	45%	11	28%	57	48%
	Total	40	100%	40	100%	40	100%	120	100%

Q3-9 How do you discharge your garden wastes generally?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Discharge it at the collection point with the other wastes for collection	1	2%	3	8%	1	2%	5	4%
2	Discharge it outside of my premises with the other wastes for collection	8	20%	5	13%	8	19%	21	17%
3	Ask the relevant authorities to send garbage collectors	0	0%	0	0%	0	0%	0	0%
4	Self-dispose	4	10%	12	30%	18	42%	34	27%
5	Composting (producing fertilizer from waste)	0	0%	1	3%	5	12%	6	5%
6	Give for composting	0	0%	0	0%	0	0%	0	0%
7	Others	0	0%	1	3%	0	0%	1	1%
99	Irrelevant	28	68%	18	45%	11	26%	57	46%
	Total	41	100%	40	100%	43	100%	124	100%

Note: Other means "place directly to hand carts."

4. Questions on Recycling and Waste Reduction

Q4-1 Recycling of waste is most effective if the waste can be sorted into different categories by the household. If the relevant authorities such as municipal councils and urban councils introduce a *separate garbage collection system*, you will be requested to separate your wastes into a number of categories, for example, such as i.) compostable waste such as food waste, paper and garden waste ii.) recyclable waste such as metals, glass, plastics, paper and iii.) other wastes. Are you willing to cooperate with this type of system?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Very much willing to cooperate	27	68%	29	73%	32	80%	88	73%
2	Somewhat willing to cooperate	7	18%	8	20%	3	8%	18	15%
3	Less willing to cooperate /somewhat unwilling to cooperate	2	5%	1	3%	1	3%	4	3%
4	Not willing to cooperate at all	4	10%	1	3%	3	8%	8	7%
5	Am doing already	0	0%	1	3%	1	3%	2	2%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-2 ***If you answered either 1 or 2 and 5***, why do you think recycling is important? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Recycling would reduce the amount of waste going to landfill	5	9%	17	24%	14	23%	36	19%
2	Recycling would help to protect environment	25	43%	36	51%	34	55%	95	50%
3	Recycling would allow you to earn some money	18	31%	11	15%	7	11%	36	19%
4	Others	4	7%	5	7%	3	5%	12	6%
99	Irrelevant	6	10%	2	3%	4	6%	12	6%
	Total	58	100%	71	100%	62	100%	191	100%

Note : Other means " these materials can be reused."

Q4-3 ***If you answered either 1 or 2 and 5***, how many categories would you be willing to separate your wastes into?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Two	23	58%	23	58%	22	55%	68	57%
2	Three	9	23%	11	28%	10	25%	30	25%
3	More than that	2	5%	4	10%	4	10%	10	8%
99	Irrelevant	6	15%	2	5%	4	10%	12	10%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-4 ***If you choose 2, 3, or 4 in Q4-1,*** what are the reasons? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	It is inconvenient and difficult	8	15%	6	12%	3	7%	17	11%
2	It may increase financial burden regarding to the discharging cost	0	0%	2	4%	0	0%	2	1%
3	It will take much time	2	4%	4	8%	4	9%	10	7%
4	Needs for the recycling system is not clear	9	17%	3	6%	1	2%	13	9%
5	Benefits of the recycling system is not clear	2	4%	2	4%	0	0%	4	3%
6	There may be poor contribution from household members	4	8%	4	8%	3	7%	11	7%
7	Others	1	2%	1	2%	0	0%	2	1%
98	Don't know	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	27	51%	30	58%	33	75%	90	60%
	Total	53	100%	52	100%	44	100%	149	100%

Note : Other means "not enough garbage to sort out" and "doubt about the success of the recycling program."

Q4-5 Is there someone who comes around to collect or buy your reusable or recyclable materials?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	30	75%	36	90%	32	80%	98	82%
2	No	10	25%	4	10%	8	20%	22	18%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-6 Which materials do they collect or buy from you?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Glass	29	31%	33	31%	26	33%	88	31%
2	Cardboard	0	0%	1	1%	1	1%	2	1%
3	Paper	22	23%	29	27%	29	36%	80	29%
4	Metal can	11	12%	14	13%	6	8%	31	11%
5	Other metal	15	16%	20	19%	8	10%	43	15%
6	Kitchen waste	0	0%	1	1%	0	0%	1	0%
7	Garden waste	0	0%	0	0%	0	0%	0	0%
8	Plastics	0	0%	0	0%	0	0%	0	0%
9	Textiles (e.g. clothes)	5	5%	1	1%	2	3%	8	3%
10	Leather, rubber	0	0%	0	0%	0	0%	0	0%
11	Wood / Timber	0	0%	0	0%	0	0%	0	0%
12	Tires	0	0%	0	0%	0	0%	0	0%
13	Others	0	0%	0	0%	0	0%	0	0%
98	Not selling / Don't know	2	2%	3	3%	0	0%	5	2%
99	Irrelevant	10	11%	4	4%	8	10%	22	8%
	Total	94	100%	106	100%	80	100%	280	100%

Q4-7 Do you take for recyclable materials to shops for refund or sale?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	15	38%	16	40%	14	35%	45	38%
2	No	25	63%	24	60%	26	65%	75	63%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-8 Which materials do you return or sell to shops?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Glass	12	26%	15	35%	9	20%	36	27%
2	Cardboard	0	0%	0	0%	0	0%	0	0%
3	Paper	2	4%	3	7%	7	16%	12	9%
4	Metal can	2	4%	0	0%	0	0%	2	2%
5	Other metal	2	4%	1	2%	1	2%	4	3%
6	Kitchen waste	0	0%	0	0%	0	0%	0	0%
7	Garden waste	0	0%	0	0%	0	0%	0	0%
8	Plastics	0	0%	0	0%	0	0%	0	0%
9	Textiles (e.g. clothes)	3	7%	0	0%	1	2%	4	3%
10	Leather, rubber	0	0%	0	0%	0	0%	0	0%
11	Wood / Timber	0	0%	0	0%	0	0%	0	0%
12	Tires	0	0%	0	0%	0	0%	0	0%
13	Others	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	25	54%	24	56%	26	59%	75	56%
	Total	46	100%	43	100%	44	100%	133	100%

Q4-9 Are you using kitchen and/or garden waste for compost?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	2	5%	3	8%	4	10%	9	8%
2	No	38	95%	37	93%	36	90%	111	93%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-10 Hazardous waste refers to items like dead batteries, used spray cans, old medicines, old household chemicals, solvents, paints, etc. Considering all the solid waste produced by your household, how many hazardous waste items would you dispose of per month?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	None	26	65%	24	60%	19	48%	69	58%
2	One to two	11	28%	15	38%	19	48%	45	38%
3	Three to five	3	8%	1	3%	1	3%	5	4%
4	Six to ten	0	0%	0	0%	0	0%	0	0%
5	More than ten	0	0%	0	0%	1	3%	1	1%
	Total	40	100%	40	100%	40	100%	120	100%

Q4-11 Suppose that you are satisfied with the service of Municipal solid waste management, either as is or as a result of improvement. Think for a moment about the largest amount of money that your household would be willing to pay each month as a garbage collection fee. (Important: If the garbage collection fee is more than this amount, your household will not be able to afford to pay and will not be able to use the garbage collection service.)

(Rs.)	Low	Middle	High	Total
Avg. amount of WTP (willingness to pay)	60	81	125	89

No. of effective answer in the middle income area is 38.

5. Public cooperation / Community participation

Q5-1 Now, we would like to ask about the community you live. In your community, do you have any community-based organizations to solve not only the waste problems but also other community problems?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	26	65%	22	55%	29	73%	77	64%
2	No	13	33%	11	28%	7	18%	31	26%
98	Don't know	1	3%	7	18%	4	10%	12	10%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-2 If yes, when did the community-based organization start functioning?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Within five years	5	13%	5	13%	10	25%	20	17%
2	Between six to ten years	4	10%	4	10%	2	5%	10	8%
3	More than eleven years ago	7	18%	4	10%	2	5%	13	11%
98	Don't know	10	25%	9	23%	15	38%	34	28%
99	Irrelevant	14	35%	18	45%	11	28%	43	36%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-3 How is the leader of this community chosen?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Democratically elected	16	40%	16	40%	11	28%	43	36%
2	Appointed by elders	4	10%	0	0%	5	13%	9	8%
3	Appointed by administration	0	0%	0	0%	0	0%	0	0%
4	Inherited	0	0%	0	0%	0	0%	0	0%
5	Others	0	0%	0	0%	0	0%	0	0%
98	Don't know	6	15%	6	15%	13	33%	25	21%
99	Irrelevant	14	35%	18	45%	11	28%	43	36%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-4 How often do you have the meetings?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	More often than once a month	14	35%	16	40%	2	5%	32	27%
2	Once in two months to five months	4	10%	1	3%	3	8%	8	7%
3	Once in six months	1	3%	0	0%	5	13%	6	5%
4	Once in seven to eleven months	0	0%	0	0%	0	0%	0	0%
5	Less often than once in a year	2	5%	1	3%	5	13%	8	7%
6	No meeting	0	0%	0	0%	0	0%	0	0%
98	Don't know	5	13%	4	10%	14	35%	23	19%
99	Irrelevant	14	35%	18	45%	11	28%	43	36%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-5 Have you ever discussed the methods of proper garbage handling and discharge at the meetings?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	14	35%	3	8%	9	23%	26	22%
2	No	8	20%	13	33%	6	15%	27	23%
98	Don't know	4	10%	6	15%	14	35%	24	20%
99	Irrelevant	14	35%	18	45%	11	28%	43	36%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-6 Have you ever been taught methods of proper garbage handling and discharge?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	24	60%	22	55%	15	38%	61	51%
2	No	16	40%	18	45%	25	63%	59	49%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-7 If "Yes" to the previous question, who taught these to you? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Parents	0	0%	2	4%	1	2%	3	2%
2	Community leaders	1	2%	0	0%	0	0%	1	1%
3	School teachers	1	2%	9	19%	10	22%	20	15%
4	Local government	23	52%	17	36%	7	15%	47	34%
5	Central government	0	0%	0	0%	0	0%	0	0%
6	NGOs	2	5%	0	0%	0	0%	2	1%
7	Others	1	2%	1	2%	3	7%	5	4%
99	Irrelevant	16	36%	18	38%	25	54%	59	43%
	Total	44	100%	47	100%	46	100%	137	100%

Note: Other means "media" and "other community development program."

Q5-8 Does anyone in your family or your servant clean the side of the road or adjacent public area in front of your premises?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes, almost everyday	18	45%	23	58%	7	18%	48	40%
2	Yes, sometimes	9	23%	12	30%	19	48%	40	33%
3	No	13	33%	5	13%	14	35%	32	27%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-9 Here please tell me about the behavior of your community population, ***and not yours.*** What are ***the most common*** methods to dispose of the garbage in this community?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Picked up by garbage collection service	40	100%	36	86%	39	95%	115	93%
2	Burnt	0	0%	2	5%	0	0%	2	2%
3	Thrown in the open space or rivers	0	0%	2	5%	1	2%	3	2%
4	Just dumped on the yard / in the garden	0	0%	2	5%	0	0%	2	2%
5	Buried on the yard / in the garden	0	0%	0	0%	1	2%	1	1%
6	Others	0	0%	0	0%	0	0%	0	0%
98	Don't know	0	0%	0	0%	0	0%	0	0%
	Total	40	100%	42	100%	41	100%	123	100%

Q5-10 Has anyone in this household, including children, received any health and environmental education or information relating to solid waste?

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Yes	27	68%	30	75%	30	75%	87	73%
2	No	13	33%	10	25%	10	25%	33	28%
	Total	40	100%	40	100%	40	100%	120	100%

Q5-11 If yes, where did this information come from? (Choose one or more)

		Low		Middle		High		Total	
		Number	%	Number	%	Number	%	Number	%
1	Parents	3	4%	10	12%	9	8%	22	8%
2	School	18	23%	21	26%	26	22%	65	23%
3	Medical worker /center / hospital	3	4%	7	9%	0	0%	10	4%
4	Community organization/ NGOs	1	1%	0	0%	0	0%	1	0%
5	Newspaper	4	5%	8	10%	18	15%	30	11%
6	Radio program	9	12%	3	4%	22	18%	34	12%
7	TV program	10	13%	16	20%	27	23%	53	19%
8	Local government	15	19%	5	6%	7	6%	27	10%
9	Central government	1	1%	1	1%	0	0%	2	1%
10	Others	0	0%	0	0%	0	0%	0	0%
99	Irrelevant	13	17%	10	12%	10	8%	33	12%
	Total	77	100%	81	100%	119	100%	277	100%

Q5-12 Do you think a campaign to raise awareness of people for maintaining the cleaner city and environment is necessary?

		Low		*Middle*		*High*		*Total*	
		Number	%	Number	%	Number	%	Number	%
1	Very necessary	26	65%	29	73%	39	98%	94	78%
2	Somewhat necessary	13	33%	10	25%	1	3%	24	20%
3	Not very necessary	1	3%	1	3%	0	0%	2	2%
4	Not necessary at all	0	0%	0	0%	0	0%	0	0%
	Total	40	100%	40	100%	40	100%	120	100%

3.2 Commercial/Industrial and Institutional Waste Generator Survey Results

Commercial/industrial and institutional interview survey results for Matale are summarized in this section (45 samples).

3.2.1 Garbage Discharge and Collection

The following table sets out the main interview survey results relating to garbage discharge and collection. Some key points are summarized below:

1) 34 (76%) enterprises receive the MMC garbage collection service, with 33 (73%) respondents using this service. 16 (45%) of the enterprises provided with a garbage collection service are not satisfied with it, the main reasons being garbage collection/sweeping is irregular (13), the discharge system is poor (12) and collection/sweeping is not properly done (11). Nine (26%) of these have complained to MMC about garbage collection at least once in the last 3 years. The Base Hospital is also concerned with the handling and disposal of hazardous healthcare wastes[1].

2) 14 (31%) enterprises pay garbage collection workers informally, the average payment being 2,098Rs/yr (range = 15 (small shop) to 12,000Rs/yr (Diana Chocolate Factory)).

[1] Although only one hospital stated this in the survey, this emerged as an issue of great concern during informal discussions with hospitals.

Table 3-1: Survey results - Garbage Discharge and Collection

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
No of respondents	14	11	17	3	45
Q1.5 – Garbage storage within premises (main method) – No of responses[1]					
a. Plastic bag	2	0	0	0	2
b. Open container	9	5	12	2	28
c. Container with lid	1	5	4	1	11
d. Place on ground/floor	1	1	0	0	2
e. Direct disposal	1	0	0	0	1
f. Other	0	0	1	0	1
Q1.6 - Main method of garbage disposal – No of responses[1]					
a. Place outside for collection	2	3	4	0	9
b. Carry to collection vehicle	3	0	0	0	3
c. Take to collection point	2	1	2	1	5
d. Labourers collect from premises	5	4	2	2	13
e. *Bury on site*	0	0	0	0	0
f. Burn on site	2	3	8	0	13
g. Recycle	0	0	0	0	0
h. Compost	0	0	0	0	0
i. Open dumping	0	0	1	0	1
Q1.8 – Walking distance to garbage collection point – No of responses (only if chose Q1.6c)					
a. 0-25m	2	1	1	0	4
b. 25-50m	0	0	0	0	0
c. 50-100m	0	0	0	0	0
d. 100-250m	0	0	0	0	0
e. Over 250m	0	0	1	0	1
Q1.12 to 1.13 – Provision and use of garbage collection service – No of responses					
Provided	13	8	10	3	34
Not provided	1	3	7	0	11
Use	13	8	9	3	33
Q1.14 - Garbage discharge and collection frequency – No of responses					
Discharge at least once daily	11	8	10	3	32
Collection at least daily	10	7	8	3	28
Q1.15 to 1.17 – Garbage collection worker payment[3]					
No giving payments	8	5	1	0	14
Average payment (Rs/yr)	146	4,200	7,200	N/a	N/a
Range (Rs/yr)	15-300	100-12,000	N/a	N/a	N/a
Q1.18 – Satisfaction with existing garbage collection service					
Satisfied (no)	11	3	4	0	18
Dissatisfied (no)	2	5	6	3	16
Reasons for dissatisfaction:					
a. Poor discharge system	1	5	4	2	12
b. Collection point too far away	0	2	2	0	4
c. Coll'n/sweep. not done properly	2	3	3	3	11
d. Collection/sweeping is irregular	0	5	5	3	13
e. Coll'n/sweep. frequency too low	1	3	0	0	4
f. Collection time is too early/late	1	1	1	2	5
g. Garbage workers behave badly	0	2	0	0	2
h. labourers demand payment	0	1	2	0	3
i. LA garbage fee is too high	0	1	1	0	2
j. Lack of recycling	0	4	1	0	5
k. Other	0	0	3	1	4
l. Problems handling hazardous healthcare waste	N/a	N/a	N/a	1	1
Q1.19 – Complaints to MMC in last 3 years – No of responses					
a. None	13	5	5	2	25
b. Once only	0	1	0	0	1
c. Several times	0	0	3	1	4
d. More than 5 times	0	2	2	0	4

Notes: Hospital garbage storage and disposal results apply to their main method of disposal – i.e. normal garbage: N/a = not applicable.

3.2.2 Improvements to Garbage Collection and Disposal

The following table sets out the main interview survey results relating to desired improvements to garbage discharge and collection. Some key points are summarized below:

1) The four most desired improvements to garbage collection and disposal in descending order are: Shorter distance to garbage collection point (weighted average rank, WAR = 29.5) > improved garbage collection frequency (WAR = 21) > greater recycling/composting (WAR = 15) > improved discharge system (WAR = 12.5).
2) Improved collection and disposal of healthcare hazardous waste was also of great concern to two of the three hospitals. The Base Hospital specifically requested the provision of an incinerator.
3) Most enterprises thought that MMC (29, 64%) or the Central government (7, 16%) or Provincial Council (6, 13%) should pay for improved garbage collection and disposal. However, eight (18%) supported the introduction of an individual garbage collection fee.
4) Nine (20%) enterprises indicated a willingness to pay (WTP) a garbage collection fee, the average WTP being 312Rs/mth (range = 100 to over 5,000 Rs/mth). Another 32 were not willing to pay anything, while four enterprises did not respond to this question. Most institutions were not willing to pay, due to being part of the government sector and stating that such decisions need to be referred to more senior government officials than the people interviewed.

Table 3-2: Survey Results – Improvements to Garbage Collection and Disposal

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
No of respondents	14	11	17	3	45
Q2.1 - Desired improvements to garbage collection/disposal – weighted average rank					
a. Improved discharge system	2	6	2.5	2	12.5
b. Closer collection point	16	2.5	7.5	3.5	29.5
c. More reliable service	2	3	3.5	0.5	9
d. Improved collection frequency	4.5	4	7.5	5	21
e. Greater recycling/composting	2	3.5	7.5	2	15
f. Improve landfill operation	2	3	1	0	6
g. Public education	4	2.5	4.5	0	11
h. Other	0	3.5	11	1.5	16
i. Improved collection/disposal of hospital hazardous waste	N/a	N/a	N/a	2	2
Q2.2 – Who should pay for improved garbage collection/disposal – No of responses					
a. Central government	2	3	2	0	7
b. Provincial Council	1	2	2	1	6
c. Local authority	10	7	10	2	29
d. Individual garbage fee	2	2	4	0	8
e. Other	0	0	1	0	1
f. No response	0	0	1	0	1
Q2.3 - Willingness to pay for improved garbage collection/disposal					
Willing to pay (no)	1	5	3	0	9
Not willing to pay (no)	13	5	11	3	32
No response (no)	0	1	3	0	4
Willingness to pay (Rs/mth)	7	1,118	107	N/a	N/a
Range (Rs/mth)	100	200-5,000	375-750	N/a	N/a

Notes: "Other" includes using new technology (3), cleaning the canals (2), supervising labourers better (1), giving labourers a uniform (1), and destroying stray dogs (1); N/a = not applicable.

3.2.3 Recycling and Possible Source Separation Collection System

The following table sets out the main interview survey results relating to recycling and a possible source separation collection system. Some key points are summarized below:

1) 45 (100%) enterprises believed recycling is necessary, with 32 (71%) enterprises being either very willing (30) or somewhat willing (2) to cooperate in separating their garbage at source. Those enterprises not willing to cooperate indicated this was mainly because it is inconvenient/difficult (10) or takes too much time (9). Conversely, those willing to cooperate indicated this was because recycling protects the environment (30), it reduces waste to disposal (14) and provides an opportunity to earn some additional money (11). 22 of these respondents were willing to sort their wastes into three (16) or more (6) categories, with the preferred source separation system being coloured plastic containers, followed closely by coloured plastic bags, collected from outside their premises.
2) Only three out of 19 enterprises indicated they were willing to pay for permanent containers, the WTP ranging from 250-1,500 Rs. Another two were willing to pay 50% or 100% of the container cost. *There were 10 no responses.*

Table 3-3: Survey Results – Recycling and Possible Source Separation System

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
No of respondents	14	11	17	3	45
Q2.4 – Recycling – No of responses					
Necessary	14	11	17	3	45
Q2.5 - Willingness to cooperate in separating wastes at source – No of responses					
a. Very willing	6	9	12	3	30
b. Somewhat willing	2	0	0	0	2
c. Less/somewhat unwilling	1	0	0	0	1
d. Not willing at all	5	2	5	0	12
e. Already sort	0	0	0	0	0
Q2.6 – Reasons for not being willing to cooperate – No of responses (only if chose Q2.5c or d)					
a. Increased financial burden	0	0	0	0	0
b. Inconvenient/difficult	4	1	5	0	10
c. Takes too much time	3	1	5	0	9
d. Needs/benefits not clear	1	0	0	0	1
e. Other	1	0	0	0	1
f. No response	0	1	0	0	1
Q2.7 – Reasons for being willing to cooperate – No of responses (only if chose Q2.5a, b or e)					
a. Reduces waste to landfill	1	8	4	1	14
b. Protects environment	6	9	12	3	30
c. Earn some extra money	2	1	6	2	11
Q2.8 – No of categories willing to separate waste into – No of responses (only for Q2.5a,b or e)					
a. Two	5	1	4	0	10
b. Three	3	6	5	2	16
c. More than three	0	2	3	1	6
Q2.9 – Preferred separate collection system – Weighted average rank (only for Q2.5a,b or e)					
a. Coloured plastic bags collected from premises	6	3	7.5	2.5	19
b. Permanent coloured containers collected from outside premises	5	9	7.5	4.5	26
c. Own bags/containers collected from outside premises	2	1.5	0	0	3.5
d. Own bags/containers taken to community collection point	0	0	0	0	0

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
Q2.10 – Willingness to pay for permanent containers for source separation system – (only for Q2.5a,b or e)					
Willing to pay (no)	0	2	1	0	3
Not willing to pay (no)	5	4	5	2	16
Willing to pay % of cost	0	1 (50%)	1 (100%)	0	2
No response (no)	3	2	5[1]	1	10
Willingness to pay (Rs)	0	167	250	N/a	N/a
Range	N/a	250-750	1,500	N/a	N/a

Notes: Most institutional respondents felt such a decision needed to be made by senior management (mainly provincial/central government) and did not give an answer; N/a = not applicable.

3.2.4 On-site Composting

The following table sets out the main interview survey results relating to on-site composting. Some key points are summarized below:

1) Five (11%) enterprises are willing to undertake on-site composting, while five are doing so already. However, the majority (34, 76%) are not in favour, mainly due to a lack of space on site (29) and it taking too much time (11). Only one enterprise was willing to pay towards the cost of a compost container – 100% in this case.

2) 29 (64%) enterprises were willing to store their organic wastes for up to one day, if they were to be collected for composting at a centralized facility.

Table 3-4: Survey Results – On-site Composting

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
No of respondents	14	11	17	3	45
Q2.11 – Willing to compost – No of responses					
a. Already compost	0	1	4	0	5
b. Willing	0	1	3	1	5
c. Not willing	14	8	10	2	34
d. No response	0	1	0	0	1
Q2.12 – Willingness to pay for compost system – (only if chose Q2.11b)					
Willing to pay (no)	Not asked	1	0	Not asked	1
Not willing to pay (no)		0	2		2
No response (no)		0	1		1
Willingness to pay (Rs)		100% cost	0		100% cost
Q2.13 – Reasons for not being willing to compost – No of responses (only if chose Q2.11c)					
a. Not enough space on site	Not asked	9	10	Not asked	29
b. Takes too much time		6	5		11
c. LA/contractor should do		0	0		0
d. No equipment		0	0		0
e. Lack of knowledge		1	2		3
f. Concern about smell/pests		0	0		0
g. Not interested		5	0		5
h. Other		3	0		3
Q2.14 – Factors that would encourage on-site composting (only if chose Q2.11b or c)					
a. Free compost container	Not asked	1	3	Not asked	4
b. Availability of cheap, easy to use, nuisance free system		1	3		4
c. Reduction in LA taxes		0	0		0
d. Education/training		1	2		3
e. Earning extra money		0	1		1

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
f. Other		1	1		2
Q2.15 – Willingness to store organic wastes between collection – No of days					
a. *Half a day*	0	1	1	1	3
b. One day	8	9	7	2	26
c. Two days	1	1	4	0	6
d. Three days	1	0	1	0	2
e. *More than 3 days*	4	1	5	0	10

Notes: N/a = not applicable.

3.2.5 Environmental Education and General Cleanliness

The following table sets out the main interview survey results relating to environmental education and general cleanliness. Some key points are summarized below:

1) 23 (51%) enterprises indicated they have received some health/environmental education related to SWM. Most people had received this training as part of their work, including vocational training (e.g. hospitals), on the job training (e.g. hotels), seminars and workshops.

2) 44 (98%) enterprises consider a cleaner city/environment awareness campaign is either somewhat necessary (43) or very necessary (1).

Table 3-5: Survey Results – Environmental Education and General Cleanliness

Item	Small Waste Gen'rs	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hospitals	
No of respondents	14	11	17	3	45
Q3.1 to 3.2 – Receipt of Health/environmental education/knowledge about SWM					
No of responses	5	3	12	3	23
Source:					
a. School	1	1	1	0	3
b. Leaflets/posters, etc.	1	1	2	0	4
c. Health worker/centre	1	1	3	3	8
d. Community organization/NGO	1	1	1	0	3
e. Newspaper	1	0	6	2	9
f. Radio programme	0	1	6	3	10
g. TV programmes	0	1	7	3	11
h. Local authority	0	0	4	1	5
i. Local authority contractor	0	0	0	0	0
j. Central government	0	0	5	0	5
k. Other	0	1	8	0	9
l. No response	0	0	0	3	3
Q3.2 – Necessity for campaign to raise peoples' awareness of need for cleaner city/environment					
a. Very necessary	12	11	17	3	43
b. Somewhat necessary	1	0	0	0	1
c. Not very necessary	0	0	0	0	0
d. Not necessary at all	1	0	0	0	1

3.2.6 Other Comments

Other comments covered a broad range of issues and are summarized below. The most common comments relate to public education/awareness raising being vital (10), polythene should be banned (7), recycling is good/important (6), and legal action should be taken against inappropriate waste handling/disposal (3).

Table 3-6: Survey Results – Other Comments

Comments	Small Waste Genr's	Large Waste Generators			Total
		Comm./ industrial	Other Inst'ns	Hosp -itals	
Education/awareness programme needed	2	3	5		10
Ban polythene	2	3	2		7
Recycling is good/important		2	2	2	6
Take legal action against those breaking the laws			2	1	3
Improve drainage system	2				2
Willing to support recycling	1	1			2
Proper SWM system needed	1				1
Keep the city clean		1			1
Protect the environment		1			1
Use cloth instead of polythene bags				1	1
Stop producing plastic			1		1
Better to have a SWM Dept			1		1
Daily collection service desired			1		1
Keep special bins on road for collecting waste			1		1
Lack of labourers is a problem				1	1
Assistance needed to set up a recycling centre		1			1
Set up a compost plant		1			1
Need an incinerator				1	1
Landfill site should be developed	1				1
Facilities needed for waste disposal			1		1
Better cleaning of canals			1		1

3.3 Cleansing Survey

Findings from Cleansing Workers Survey in Matale

A questionnaire survey was conducted among 33 municipal cleansing workers, in order to gather;

- Basic socio-economic profiles of cleansing workers.
- An appreciation of working condition of municipal cleansing workers.

Period of survey: From June 25, 2002 to July 2, 2002
Sample size: 33

1. General Questions

Q1-1 *Gender*

		Matale	
		Number	%
1	Male	16	48%
2	Female	17	52%
	Total	33	100%

Q1-2 Ethnicity

		Matale	
		Number	%
1	Sinhala	2	6%
2	Muslim	0	0%
3	Tamil	31	94%
4	Other	0	0%
	Total	33	100%

Q1-3 Religion

		Matale	
		Number	%
1	Buddhist	2	6%
2	Islam	0	0%
3	Hindu	27	82%
4	Christian	4	12%
5	Other	0	0%
	Total	33	100%

Q1-4 Household information

(person)	Matale
Avg. number of family members	5.9

(Rs.)	Matale
Avg. household income	9,802

(Rs.)	Matale
Income per person	1,650

Q1-5 How much is the total expenditure of your household per month on average?

(Rs.)	Matale
Avg. household expenditure	6,155

(Rs.)	Matale
Expenditure per person	1,036

Q1-6 Please specify the priority for your daily life regarding the improvement of the following aspects ?

		Matale	point
1	First	Others (Toilet / housing problems)	45
2	Second	Waste water collection	43
3	Second	Storm water drainage	22
4	Fourth	Access road to my house	17
5	Fifth	Electricity supply	16
6	Sixth	Water supply	5
7	Seventh	Garbage collection	4

2. Questions about Your Work

Part A : Status and Wage

Q2-1 Are you a permanent worker or a casual worker?

		Matale	
		Number	%
1	Permanent	27	82%
2	Casual	6	18%
3	Kangani or a head of labors	0	0%
	Total	33	100%

Q2-2 How long have you been doing this job?

(years)	Matale
Average working years	17.5

Q2-3 How many days do you usually work per week?

(days)	Matale
Average working days per week	6.0

Q2-4 *How many hours do you usually work per day?*

(hours)	Matale
Average working hours per day	7.5

Q2-5 *Had either your father or mother done this same job?*

		Matale	
		Number	%
1	Yes	28	85%
2	No	5	15%
	Total	33	100%

Q2-6 How much is your monthly wage on average (including official allowance such as holiday pay, overtime and so on)?

(Rs)	Matale
Average monthly income	5,641

Q2-7 Do you have any secondary jobs after working hours?

		Matale	
		Number	%
1	Yes	9	27%
2	No	24	73%
	Total	33	100%

Q2-8 How often and what type of work do you do as a secondary job?

(1) How often: Four out of nine workers work weekly basis and the rest works a few days per week.
(2) Type of work: Labor work such as cleaning houses, shops and as servants.

Q2-9 How much is your monthly wage on average from this secondary resource?

(Rs)	Matale
Average monthly income from secondary job	1,072

Note : After adjusted by omitting extreme values, numbers of effective answers are nine only.

Q2-10 Are there some waste generators which give you small allowance, including the reward to your extra cleaning work?

		Matale	
		Number	%
1	Yes	11	33%
2	No	22	67%
	Total	33	100%

Q2-11 How much is your income from small allowance per month on average?

(Rs)	Matale
Average monthly allowance from waste generators	149

Note: No. of effective answers are eleven only on this question

Q2-12 Do you know other solid waste laborers who sometimes receive a small allowance?

		Matale	
		Number	%
1	Yes	14	42%
2	No	10	30%
98	Don't know	9	27%
	Total	33	100%

Q2-13 Do you collect recyclable materials from waste for sale?

		Matale	
		Number	%
1	Yes	10	30%
2	No	23	70%
	Total	33	100%

Q2-14 If yes to Q2-13, what materials do you collect, how much do you collect per month and who do you sell them to?

		Matale	
		Number	%
1	Bottle	9	33%
2	Iron	8	30%
3	Metal can / Tin	2	7%
4	Aluminum	5	19%
5	Cardboard	0	0%
6	Brass	1	4%
7	Copper	1	4%
8	Glass	1	4%
	Total	27	100%

(Rs.)	Matale
Average monthly income from recycling	194

Note: No. of effective answers are eight only on this question.

Part B : Working Conditions and Technical Problems

Q2-15 These are the possible difficulties you may face. Please prioritize your difficulties?

	(points)	Matale
1	Heavier workload and unhealthier conditions due to the improper discharge of waste by people	32.5
2	Unsanitary waste such as human waste / excrement is mixed with other waste	26
3	Heavier workload for you due to absenteeism among your colleagues	3
4	Heavier workload for you due to alcoholism among your colleagues	6.5
5	Insufficient wage	59.5
6	Health problems	33.5
7	The working schedule such as allocation of vehicles and routes are so changeable	6.5
8	Lack of protecting clothing (boots, gloves, apron and so on)	44.5
9	Vehicle often breakdown	14.5
10	Not enough tools for cleansing work	49.5
11	Vehicle parked on the street makes your work more difficult	14
12	Others	14.5
	Total	304.5

Note: Most of others are either "animal problems" or "less appreciation by MC and citizens."

Q2-16 Are there any particular areas of the city where you feel difficult to collect garbage?

		Matale	
		Number	%
1	Yes	18	55%
2	No	15	45%
	Total	33	100%

Q2-17 If yes to the previous question, what are the reasons of difficulties?

		Matale	
		Number	%
1	Improper discharge of waste by people	3	9%
2	Physically difficult work	1	3%
3	Large amount of garbage	8	24%
4	Traffic and many people	3	9%
5	Road	1	3%
6	Other	2	6%
98	Don't know	0	0%
99	Irrelevant	15	45%
	Total	33	100%

Q2-18 When difficulties relating to your work arise, whom you talk to first? (***Choose only one.***)

		Matale	
		Number	%
1	Officer in charge such as PHI and MOH	0	0%
2	Supervisor	32	97%
3	Minor supervisor	1	3%
4	Colleagues	0	0%
5	Others	0	0%
	Total	33	100%

Q2-19 How do you think MC / UC can improve the garbage collection system? Please give your honest opinion.

		Matale	
		Number	%
1	Household / citizens contribution	0	0%
2	Need salary increase	4	8%
3	Need more workers	12	23%
4	Need awareness program	6	11%
5	Need more equipments / vehicles	7	13%
6	Health protection incl. introducing protecting clothing	7	13%
7	Others	12	23%
98	Don't know	5	9%
	Total	53	100%

3.4 Middlemen Survey

3.4.1 Survey Sheet

Middlemen and Micro-industries Recycling Survey

Interviewer:		Date:	

General Information:

Name of Interviewee:	
Position of Interviewee:	
Name of Business:	
Address/location:	
No of Years of Operation:	

Nature of Business:

a) What are the main activities of your business?

Recycling Activities Collection Details

3.1 What materials do you recycle and in what condition? *(please circle the materials recycled and their condition in the table below)*

Materials	**Condition**				
Plastics	Mixed, unwashed	Sorted, unwashed	Sorted, clean	Other	
Polythene	Mixed, unwashed	Sorted, unwashed	Sorted, clean	Other	
Bags	Polysacks	Flour bags	Poultry feed bags	Sugar bags	Other
Paper	Old newspapers	Old exercise books	White paper	Cardboard/ boxes	Other
Glass	Whole Arrack bottles	Whole beer bottles	Other whole bottles/jars	Broken bottles	Other
Metals	Aluminium	Beer cans	Copper/brass	Ferrous	Other
Tyres	Small			Large	
Other	Old battery cases (washed, cleaned)		Wood		Other

Please describe what "other" means below:

.....

.....

3.2 Who collects these recyclable materials for you? (*tick one or more and describe the type of wastes to which they apply)*

		Tick	*Waste Types*
(a)	Individuals	[ ]	.....
(b)	You and/or some of your workers	[ ]	.....
(c)	LA/private contractor garbage collection labourers	[ ]	.....
(d)	Community groups/non-governmental organizations	[ ]	.....
(e)	Middlemen	[ ]	.....
(f)	Other – describe:	[ ]	.....

3.3 What are the main sources these recyclable materials come from? (*fill in the table with the materials you recycle, the main sources and the approximate percentages from these sources if you know them*)

Materials	**Main sources**			
	First	Second	Third	Others
e.g. Cardboard	*C (75%)*	*M (15%)*	*Ht (5%)*	*S, GO (5%)*

Use the following codes:

H	Households	Ht	Hotels	Hp	Hospitals
C	Commercial enterprises (e.g. shops, banks, etc.)	GO	Government offices	I	Industries
M	Markets	S	Schools	O	Other

Please describe what "other" means below: .....

.....

3.4 Where do these recyclable materials come from and what is the approximate percentage of materials collected from each area?

		Tick	*%*
(a)	Within Urban/Municipal Council Area	[ ]	[ ]
(b)	Within District	[ ]	[ ]
(c)	Within Province	[ ]	[ ]
(d)	Other Areas – describe:	[ ]	[ ]

3.5 Fill in the table below with the following information:

(a) *On average, how many units (kg, items, etc.) of these recyclable materials do you collect per month?*
(b) How much do you pay for such materials per unit (Rs/kg, Rs/item, etc.)?
(c) Is your demand for these materials stable?
(d) Is the supply greater than or less than your demand?

Please add any relevant comments on demand/supply issues for these materials below the table.

Material	Quantity	Price paid	Total payment (Rs/mth)	Demand stable	Supply vs. demand
e.g. Clean, sorted plastics	*80kg/mth*	*5Rs/kg*	*400 Rs*	*Yes*	*Greater*
Total payment					

Comments:.....

.....

Worker Details

In the table below, indicate the number of full-time and part-time workers, including yourself, and in each case, the average number of hours worked per week and days worked per month **on the recycling activities** carried out by your business.

Table 2 : WorkerDetails

Workers	No	Hrs worked per wk on recycling activities	Days worked per month on recycling activities
Manager/owner			
Full-time worker			
Part-time worker			

Recycling Activities Processing/Sales Details (fill in Table 3 with answers)

5.1 What do you do with these materials? (*tick one or more and describe the types of waste to which they apply)*

		Tick	*Waste Types*
(a)	Transport directly to factories	[ ]	.....
(b)	Pre-process (e.g. sort, wash, dry) and transport to factories	[ ]	.....
(c)	Process (e.g. grind, pelletise, etc.) and transport to factories	[ ]	.....
(d)	Use as raw materials for making other products	[ ]	.....
(e)	Other – describe:	[ ]	.....

5.2 If you ticked (d) in Q5.1, what products do you make from these materials?

.....

.....

5.3 Who do you sell these materials and/or the products you make from them to? Where relevant (e.g. commercial, industrial), specify the name, location and how far away are these places are located.

Customers	Materials sold	Name	Location	Distance (km)
Individuals				
Commercial enterprises (e.g. shops, markets)				
Tourists				
Factories for further processing				
Other				

Please describe what "other" means: .....

.....

Fill in the table below with the following information:

(a) How many units (kg, items) of these materials and/or products do you sell per month?
(b) How much do you sell these materials and/or the products you make from them for?
(c) Is the demand for any products you make from these materials small, medium or large?

Material	Quantity	Sales Price	Income (Rs/mth)	Demand
e.g. Plastic pellets	*50kg/mth*	*40Rs/kg*	*2,000*	*Medium*
Total income:				

Comments:.....

.....

What is your average expenditure and income per month from these recycling activities:

Average operating expenses = Rs/mth
Average income = Rs/mth
Net income = Rs/mth

What are the main costs incurred by your business in these recycling activities?; and what is the approximate percentage total costs in each category? *(tick all that apply and estimate the approximate percentages of the five main types. If you do not know this, just rank the five main types, 1 = highest, 2 = 2nd highest, etc.)*

	Tick	% or rank
(a) Buying the recyclable materials	[ ]	[ ]
(b) Storage prior to transportation	[ ]	[ ]
(c) Transportation	[ ]	[ ]
(d) Labour	[ ]	[ ]
(e) Other raw materials (e.g. chemicals, additives)	[ ]	[ ]
(f) Utilities (electricity, water, telephone, etc.)	[ ]	[ ]
(g) Land/building rental	[ ]	[ ]

(h) Machinery maintenance	[ ]	[ ]
(i) Other – describe:	[ ]	[ ]

Other Information

How much waste do you produce from your recycling activities per month?
Answer: ..... kg/mth

What do you do with the waste from your recycling activities? (*tick one or more*)

(a) All waste is recycled	[ ]
(b) Collection by LA/private contractor	[ ]
(c) Bury/burn on property	[ ]
(d) Other - describe:	[ ]

What are the main issues/problems facing your recycling activities? *(tick all that apply and rank up to the five most serious problems, 1 = worst, 2 = 2nd worst, etc.)*

	Tick	*Rank*
(a) Shortage of recyclable materials	[ ]	[ ]
(b) Contamination/poor quality of recyclable materials	[ ]	[ ]
(c) High land/building rental costs	[ ]	[ ]
(d) Excessive transportation costs	[ ]	[ ]
(e) Unstable demand for recyclable materials and/or products	[ ]	[ ]
(f) Utilities problems (e.g. electricity cuts, no water, etc.)	[ ]	[ ]
(g) Loss of market (e.g. collapse of tourism)	[ ]	[ ]
(h) Difficulties in obtaining credit	[ ]	[ ]
(i) Other - describe:	[ ]	[ ]

Comment on what could be done to help solve these problems/issues?

.....

.....

Any other comments/useful information?

.....

.....

Notes for interviewer:

1. Check that quantities collected for recycling tally with quantities sold on to others, where relevant.
2. Check that costs and income tally with quantities and indicated sales prices.

3.4.2 Result 1

	Middlemen		1	1	2	3.1																			
ID No	Business name	Address/location	Opn Yrs	Main activities		Plastics				Bags					Paper				Glass				
						MU	SU	CS	Tot	PS	FB	PFB	SB	Tot	NP	EB	WP	Tot	Arr	BB	BJ	Br	Tot
MM01	United Traders	43, Mosque Rd, Matale,066-30803	4	Buying and selling of recyclable materials															Y	Y		Y	
MM02	Rushan Traders	115A, Raththota Rd, Kaludawala	3	Buying and selling of recyclable materials											Y				Y	Y		Y	
MM03	Kandy Hardware	06, Godapola Rd, Matale	15	Hardware																			
MM04	Sooriya Metals	485, Main St, Matale	30	Buying and selling of recyclable materials		Y					Y		Y			Y			Y	Y	Y	Y	
MM05	Indra Stores	11, Godapola Rd, Matale, 066-31033	16	Buying and selling of recyclable materials											Y	Y	Y		Y	Y		Y	
MM06	Thushantha Traders	522, Main St, Matale	24	Buying and selling of recyclable materials							Y	Y	Y		Y	Y			Y	Y	Y		
MM07	Heritage Centre	Heritage Centre, Matale	18	Batiks + metal workshop																			
Total		Total number of middlemen surveyed	7		No	1	0	0	0	0	2	1	2	0	3	3	1	0	5	5	2	4	0
						No polythene																	

Notes:

1. Cells containing formulae shaded in light blue - do not use.

2. NA = no answer; IR = irrelevant

3. MM07 is located outside Matale but collects all its recyclables from within Matale - hence, it has been included here.

ID No	Metals					Other			Oth=	3.2 Collectors								3.3 Main sources													
	Al	BC	CB	Fe	Tot	Ba	Oth	Tot		Pl	Po	Ba	Pa	Gl	Me	Oth	Tot	Plastic (%)						Bags (%)				Paper/cardboard (%)							
																		H	Ht	Hp	C	I	O	H	C	Hp	O	H	Ht	Hp	C	M	S	I	O
MM01	Y	Y	Y	Y		Y								A	A	A	A																	
MM02	Y		Y	Y		Y							A/B/E	A/B/E	A/B/E	A/B/E	A/B/E											60	0	0	0	0	40	0	0
MM03	Y		Y	Y											A/E		A/E																	
MM04	Y		Y	Y		Y	Y		Lead	A/E		A/E	A/E	A/E	A/E	A/E	A/E	30	70	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	0
MM05	Y	Y	Y	Y		Y							A	A	A	A	A											100	0	0	0	0	0	0	0
MM06	Y	Y	Y	Y		Y						A		A	A		A							0	100	0	0	100	0	0	0	0	0	0	0
MM07	Y		Y												E		E																	
Total	7	3	7	6	0	5	1	0									Avg	30	70	0	0	0	0	0	100	0	0	90	0	0	0	0	10	0	0
										Count							Wt avg	30	70	0	0	0	0	0	100	0	0	99	0	0	0	0	1	0	0
A	1	0	2	3	5	6	4	6										Sum =	100					Sum =	100			Sum =	100						
B	0	0	0	1	1	1	1	1																											
C	0	0	0	0	0	0	0	0																											
D	0	0	0	0	0	0	0	0																											
E	1	0	1	2	2	4	2	4																											
F	0	0	0	0	0	0	0	0																											

Qtys of different materials collected by different middlemen used in calculating weighted average sources (%) in Q3.3

	Pl	Bg	P/C	Glass			Me	Ba	
				Br	Bo	Tot			
MM1	0	0	0	50	0	50	218	40	
MM2	0	0	15	50	60	89.6	317	50	
MM3	0	0	0	0	0	0	15250	0	
MM4	10	500	250	2000	8000	7280	3475	1500	
MM5	0	0	300	50	200	182	1360	300	
MM6	0	4000	50	0	5000	3300	3000	1000	Check
MM7	0	0	0	0	0	0	15	0	total
Total	10	4500	615	2150	13260	10902	23635	2890	38492
	no	no	kg	kg	no	kg	kg	kg	OK

One bottle weighs 0.66 kg

Total glass = kg broken glass + no of bottles x wt of one bottle

One sack weighs 0.1 kg

Must adjust this table after entering data to eliminate any values for which there is NA in Q3.3 - do manually

Adjusted cells shaded in orange

ID No	Glass (%)						Metals (%)							Batteries (%)					Prop	3.4 Collection area (%)				4 Worker details									Total	Equiv
	H	Ht	Hp	M	I	O	H	Ht	Hp	C	GO	I	O	H	C	Hp	M	O	(%)	A	B	C	D	Manager/owner			Full-time workers			Part-time workers			H/mth	FT
																								No	Hr/wk	d/mth	No	Hr/wk	d/mth	No	Hr/wk	d/mth		
MM01	100	0	0	0	0	0	30	0	0	0	0	0	70	0	0	0	0	100	0.3	80%	20%			1	40	20	N			N			114	0.5
MM02	100	0	0	0	0	0	70	0	0	0	0	0	30	40	40	0	0	20	0.5	40%	60%			2	48	26	N			N			178	0.9
MM03							20	0	0	0	30	30	20						13.0	25%		25%	50%	1	35	25	N				2	10	4	131	0.6
MM04	100	0	0	0	0	0	40	0	0	0	0	0	60	70	30	0	0	0	49.0	20%	80%			1	42	26	1	42	26	1	6	2	314	1.5
MM05	100	0	0	0	0	0	100	0	0	0	0	0	0	30	0	0	0	70	2.1	50%	20%		30%	1	60	26	1	60	26	N			446	2.1
MM06	100	0	0	0	0	0	60	0	0	0	0	0	40	80	0	0	0	20	35.1	60%	40%			2	120	26	2	120	26	1	4	4	894	4.3
MM07										100									0.0	100%				5	7	20	3	120	20	N			363	1.7
Total	100	0	0	0	0	0	53	0	0	14	5	5	37	44	14	0	0	42	Avg	36%	54%	3%	7%	13			7			4			2439	11.7
	100	0	0	0	0	0	33	0	0	0	19	19	28	66	16	0	0	16																
	Sum =		100				Sum =		100					Sum =		100																		

Assume Equiv FT worker = 208 h/mth in private sector
(8h/d x 26d/mth)
For MM06, assume 4 d/mth for part-time workers
based on hours/wk

"Prop" column lists proportion of materials collected from different sources, as calculated in purchases sheet - used for calculating weighted averages in Q3.4

MM1 - O = garage

R = retail
WS = wholesal
A
B
C
D
E
NA
IR

	5.1 Processing							5.2 Products	5.3 Customers							
ID No	Pl	Po	Ba	Pa	Gl	Me	Oth	Products	Pl	Po	Ba	Pa	Gl	Me	Oth	Name, location, distance (km)
MM01					Ws	Ws	Ws	N					CE	CE,F	CE	Prasadh Traders,Akka Kade Kandy 24 km, Pilimathalawa 35
MM02				R/Ws	Ws	Ws	Ws	N								
MM03						Ws		N						In		N/a
MM04			R	R	R	Ws	Ws	N								
MM05				R	R	Ws	R/Ws	N								
MM06			R/Ws	R/Ws	R/Ws	R/Ws	R/Ws	N			In	In	In	In/Ws		Colombo
MM07						D		Ornaments, Statues,Locks							Oth	Exhibitions in Colombo, Tourists
Total									Ct							Total
	0	0	2	4	3	1	2	In	0	0	1	1	1	2	0	
	0	0	1	2	3	6	5	CE	0	0	0	0	1	1	1	
	0	0	0	0	0	0	0	F	0	0	0	0	0	1	0	
	0	0	0	0	0	0	0	Ws	0	0	0	0	0	1	0	
	0	0	0	0	0	0	0	Oth	0	0	0	0	0	0	1	
	0	0	0	0	0	1	0	IR	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	NA	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	Sum	0	0	1	1	2	5	2	
	0	0	0	0	0	0	0		Use "In" for individuals							

	5.5 Profit			Exp and Income check			5.6 Main costs									6.1	6.2	6.3								6.4	6.5
ID No	Expendi-ture	Income	Net income	Recycl Payments	Recycl Sales	Net income	A	B	C	D	E	F	G	H	I	Qty (kg/mth)	Act-ion	Main problems A	B	C	D	E	F	G	H	I	Comments on what could be done to help solve these problems	Other
MM01	15000	18000	3000	2925	3415	490	1			4		2	3			3	B	1		2							Recycl. items are rare, transport facilities	Ban plast./polyth.
MM02	20000	25000	5000	3030	3895	865	1		2						3	25	C				2				1		Credit facilities	
MM03	NA	NA	NA	66500	84750	18250	1			3		2				15	B	1							2	3	Credit facilities	
MM04	80000	90000	10000	110575	135000	24425	1		4	5		2	3			40	B	1		2	3		4				Credit facilities	
MM05	30000	35000	5000	39800	46175	6375	1		4	2		3	5			50	B			2			3		1		Credit facilities	Ban plast./polyth.
MM06	95000	NA	NA	92400	107500	15100	1		2	3		4				15	B			4	1		5		3	2		
MM07	15000	3000	12000	1365	2500	1135			5	1	4	2		3		2	C					2		1			Fin. assistance, better mkt,new tech	
Total	255000	NA	NA	316595	383235	66640																					**Notes:**	

From recyclables purchases and sales data

	Rank	A	B	C	D	E	F	G	H	I
1	2.5	6	0	0	1	0	0	0	0	0
2	2	0	0	2	1	0	4	0	0	0
3	1.5	0	0	0	2	0	1	2	1	1
4	1	0	0	2	1	1	1	0	0	0
5	0.5	0	0	1	1	0	0	1	0	0
	Sum	6	0	5	6	1	6	3	1	1
	Wt avg	15	0	7	9	1	11	4	2	2

Oth = tax

From comparison of recyclables and purchases data, suspect data identified (shaded in orange)

	Rank	A	B	C	D	E	F	G	H	I
1	2.5	3	0	0	1	0	0	1	2	0
2	2	0	0	3	1	1	0	0	1	1
3	1.5	0	0	0	1	0	1	0	1	1
4	1	0	0	1	0	0	1	0	0	0
5	0.5	0	0	0	0	0	1	0	0	0
	Sum	3	0	4	3	1	3	1	4	2
	Wt av	7.5	0	7	6	2	3	3	9	4

MM02,MM07 - C = burn

3.4.3 Result 2

Section	1	3.1	3.5																											
		Plastics								Bags								Newspaper							Exercise books						
ID No	Business name	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD
MM01	United Traders						0					bags		ea	0				kg		/kg	0				kg		/kg	0		
MM02	Rushan Traders						0					bags		ea	0			15	kg	8	/kg	120	Y	>		kg		/kg	0		
MM03	Kandy Hardware						0					bags		ea	0				kg		/kg	0				kg		/kg	0		
MM04	Sooriya Metals	PC	10	can	45	Rs	450	Y	>	polys	500	bags	5.5	ea	2750	Y	>		kg		/kg	0			250	kg	6	/kg	1500	Y	>
MM05	Indra Stores						0					bags		ea	0			300	kg	20	/kg	6000	Y	>		kg		/kg	0		
MM06	Thushantha Traders						0			polys	4000	bags	5	ea	20000	Y	>	50	kg	18	/kg	900	Y	>		kg		/kg	0		
MM07	Heritage Centre						0					bags		ea	0				kg		/kg	0				kg		/kg	0		
	Total		10	kg cont/barrel			450	Rs			4500	bags		ea	22750	Rs		365	kg		/kg	7020	Rs		250	kg		/kg	1500	Rs	

MM06: Purchases qty = 5000; sales = 3000 adjusted to 4000

MM04 - assume both EB and newspaper

Notes:

1. *Blue shaded cell indicates no quantity or cost information given (NA inserted in units column rather than qty column, as the latter upsets the spreadsheet calculations)*
2. Green shaded cell indicates data that has been modified so that sales and purchases figures are consistent.
3. NA = no answer

Section																																			
	Cardboard/boxes							Broken glass							Arrack/beer/other bottles								Metals - ferrous							Metals - copper/brass						
ID No	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD
MM01		kg		/kg	0			50	kg	2.5	/kg	125	Y	>	NA		Bott		ea	0			200	kg	6	/kg	1200	Y	>	15	kg	70-80	/kg	1,150	Y	>
MM02		kg		/kg	0			50	kg	1	/kg	50	Y	>	Arr/BB	60	Bott	4	ea	240	Y	>	300	kg	5	/kg	1500	Y	>	7	kg	60	/kg	420	Y	>
MM03		kg		/kg	0				kg		/kg	0					Bott		ea	0			15000	kg	3.5	/kg	52500	Y	>	200	kg	60	/kg	12000	Y	>
MM04		kg		/kg	0			2000	kg	1	/kg	2000	Y	>	Arr/BB	8000	Bott	5	ea	40000	Y	>	3000	kg	6	/kg	18000	Y	>	400	kg	70-80	/kg	30500	Y	>
MM05		kg		/kg	0			50	kg	2	/kg	100	Y	>	Arr/BB	200	Bott	6	ea	1200	Y	>	1000	kg	7	/kg	7000	Y	>	60	kg	80	/kg	4800	Y	>
MM06		kg		/kg	0				kg		/kg	0			Arr/BB	5000	Bott	5	ea	25000	Y	>	2500	kg	5	/kg	12500	Y	>	200	kg	60	/kg	12000	Y	>
MM07		kg		/kg	0				kg		/kg	0					Bott		ea	0				kg		/kg	0			8	kg	105	/kg	840	N	>
	0	kg		/kg	0	Rs		2150	kg		/kg	2275	Rs			13260	bottles		ea	66440	Rs		22000	kg			92700	Rs		890	kg			61710	Rs	

MM01: 5kg Cu @ 70Rs,10kg brass @ 80Rs
MM02: 2kg C, 5kg B
MM03: 100kg of each
MM04: 150Cu and 250 Br @ 70 & 80 resp.
MM05:30kg of ea @ 80
MM06: 100kg of ea @60
MM07: 8kg of brass

Section																							Total quantities						Proportion
	Metals - Aluminium							Metals - lead							Batteries								Cont-	Bottles	Bags	Kg	Payments	Actual	of total
ID No	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD		ainers	(no)	(no)		(Rs)		(%)
MM01	3	kg	50	/kg	150	Y	>		kg		/kg	0			40	kg	7.5	/kg	300	Y	>		0	0	0	308	2,925	=	0.3
MM02	10	kg	50	/kg	500	Y	>		kg		/kg	0			50	kg	4	/kg	200	Y	>		0	60	0	432	3,030	=	0.5
MM03	50	kg	40	/kg	2000	Y	>		kg		/kg	0				kg		/kg	0				0	0	0	15250	66,500	=	13.0
MM04		kg		/kg	0			75	kg	25	/kg	1875	Y	>	1500	kg	9	/kg	13500	Y	>		10	8000	500	7225	110,575	>	49.0
MM05	300	kg	60	/kg	18000	Y	>		kg		/kg	0			300	kg	9	/kg	2700	Y	>		0	200	0	2010	39,800	>	2.1
MM06	300	kg	50	/kg	15000	Y	>		kg		/kg	0			1000	kg	7	/kg	7000	Y	>		0	5000	4000	4050	92,400	>	35.1
MM07	7	kg	75	/kg	525	N	>		kg		/kg	0				kg		/kg	0				0	0	0	15	1,365	=	0.0
	670	kg			36175	Rs		75	kg			1875	Rs		2890	kg			23700				10	13260	4500	29290	316595		100.0
																								(kg)	(kg)				
																								8752	450	38492			

"Actual" column advises whether actual payments will be higher based on whether or not complete information was supplied.
(Proportion column calculates the proportion of total materials collected by different enterprises as (no of containers/total containers + no of bottles/total bottles + no of bags/total bags + kg/total kg)/4 * 100% - used in general spreadsheet

1 polysack weighs 0.1 kg (measured)
1 bottle weighs 0.66 kg (measured)

3.4.4 Result 3

	1	3.1	5.4																										
		Plastics							Polysacks						Newspaper						Paper - exercise books						Cardboard					
ID No	Business name	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem
MM01	United Traders						0			Bags		ea	0			kg		/kg	0			kg		/kg	0			kg		/kg	0	
MM02	Rushan Traders						0			Bags		ea	0		15	kg	12	/kg	180	Low		kg		/kg	0			kg		/kg	0	
MM03	Kandy Hardware						0			Bags		ea	0			kg		/kg	0			kg		/kg	0			kg		/kg	0	
MM04	Sooriya Metals	PI	10	Can	50	Rs	500	Med	500	Bags	6.5	ea	3250	NA		kg		/kg	0		250	kg	7	/kg	1750	Med		kg		/kg	0	
MM05	Indra Stores						0			Bags		ea	0		300	kg	20.5	/kg	6150	Med		kg		/kg	0			kg		/kg	0	
MM06	Thushantha Traders						0		4000	Bags	6	ea	24000	NA	50	kg	20	/kg	1000	Med		kg		/kg	0			kg		/kg	0	
MM07	Heritage Centre						0			Bags		ea	0			kg		/kg	0			kg		/kg	0			kg		/kg	0	
	Total		0	Cont			500	Rs	4500	bags		ea	27250	Rs	365	kg		/kg	7330	Rs	250	kg		/kg	1750	Rs	0	kg		/kg	0	Rs

MM06: Purchases qty = 5000; sales = 3000 adjusted to 4000

MM04 - assume both EB and newspaper

Notes:

1. Blue shaded cell indicates no quantity or cost information given (NA inserted in units column rather than qty column, as the latter upsets the spreadsheet calculations)
2. Green shaded cell indicates data that has been modified so that sales and purchases figures are consistent.
3. NA = no answer

ID No	Broken glass						Glass - Arrack/beer/other bottles						Metals - ferrous						Metals - copper/brass						Metals - Aluminium					
	Qty	Unit	Price	Unit	Total	Dem	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem
MM01	50	kg	3.5	/kg	175	Med	NA		Bott		ea	0		200	kg	7	/kg	1400	Med	15	kg	85	/kg	1300	Med	3	kg	60	/kg	180	Med
MM02	50	kg	1.5	/kg	75	Low	Arr/BB	60	Bott	5	ea	300	Low	300	kg	6.5	/kg	1950	Low	7	kg	70	/kg	490	Low	10	kg	55	/kg	550	Low
MM03		kg		/kg	0				Bott		ea	0		15000	kg	4.5	/kg	67500	Med	200	kg	75	/kg	15000	Med	50	kg	45	/kg	2250	Med
MM04	2000	kg	2	/kg	4000	Med	Arr/BB	8000	Bott	6.5	ea	52000	Med	3000	kg	7	/kg	21000	Med	400	kg	85	/kg	34500	Med		kg		/kg	0	
MM05	50	kg	2.5	/kg	125	High	Arr/BB	200	Bott	6.5	ea	1300	Med	1000	kg	9.5	/kg	9500	Med	60	kg	87.5	/kg	5250	Med	300	kg	70	/kg	21000	Med
MM06		kg		/kg	0		Arr/BB	5000	Bott	6	ea	30000	Med	2500	kg	6	/kg	15000	Med	200	kg	65	/kg	13000	High	300	kg	55	/kg	16500	High
MM07		kg		/kg	0				Bott		ea	0			kg		/kg	0	High		kg		/kg	0			kg		/kg	0	
	2150	kg		/kg	4375	Rs		13280	Bott		ea	83600	Rs	22000	kg		/kg	116350	Rs	882	kg		/kg	69540	Rs	883	kg		/kg	40480	Rs

MM01: 5kg Cu @ 80Rs, 10kg Brass @ 90Rs
MM02: 2kg C, 5kg B
MM03: 100kg of each
MM04: 150Cu and 250 Br @ 80 & 90 resp.
MM05:30kg of ea @ 87.5
MM06: 100kg of ea @65

	Metals -lead						Batteries						Total quantities					
ID No	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Cont-ainers	Bottles	Bags	Kg	Sales (Rs)	Actual
MM01		kg		/kg	0		40	kg	9	/kg	360	Med	0	0	0	308	3415	=
MM02		kg		/kg	0		50	kg	7	/kg	350	Low	0	60	0	432	3895	=
MM03		kg		/kg	0			kg		/kg	0		0	0	0	15250	84750	=
MM04	75	kg	30	/kg	2250	Med	1500	kg	10.5	/kg	15750	Med	10	8000	500	7225	135000	>
MM05		kg		/kg	0		300	kg	9.5	/kg	2850		0	200	0	2010	46175	>
MM06		kg		/kg	0		1000	kg	8	/kg	8000	Med	0	5000	4000	4050	107500	>
MM07		kg		/kg	0			kg		/kg	0		0	0	0	0	2500	=
	75	kg		/kg	2250	Rs	2890	kg		/kg	27310	Rs						
													10	13260	4500	29275	383235	

MM07: 30,000 sales/yr

3.4.5 Data summary for graphs

Q3.3

	Main sources (%)					
	Plastic	Bags	Paper/card	Glass	Metals	Batteries
Households	30.0	0.0	99.0	100.0	33.4	67.8
Hotels	70.0	0.0	0.0	0.0	0.0	0.0
Hospitals	0.0	0.0	0.0	0.0	0.0	0.0
Commercial	0.0	100.0	0.0	0.0	0.1	16.3
Markets	0.0	0.0	0.0	0.0	0.0	0.0
Schools	0.0	0.0	1.0	0.0	0.0	0.0
Government offices	0.0	0.0	0.0	0.0	19.4	0.0
Industries	0.0	0.0	0.0	0.0	19.4	0.0
Other	0.0	0.0	0.0	0.0	27.9	15.9
	100.0	100.0	100.0	100.0	100.0	100.0

Other is mainly from garages

Q5.6

	Rank	1	2	3	4	5	Wt avg
A	Purchases	6	0	0	0	0	15
B	Storage	0	0	0	0	0	0
C	Transportation	0	2	0	2	1	6.5
D	Labour	1	1	2	1	1	9
E	Other raw materials	0	0	0	1	0	1
F	Utilities	0	4	1	1	0	10.5
G	Land/building rental	0	0	2	0	1	3.5
H	Machinery maintenance	0	0	1	0	0	1.5
I	Other	0	0	1	0	0	1.5
	Sum	7	7	7	5	3	48.5

Q6.3

	Rank	1	2	3	4	5	Wt avg
A	Shortage of recyclables	3	0	0	0	0	7.5
B	Contamination/poor quality	0	0	0	0	0	0
C	High land/building rental cost	0	3	0	1	0	7
D	High transportation costs	1	1	1	0	0	6
E	Unstable demand	0	1	0	0	0	2
F	Utilities	0	0	1	1	1	3
G	Loss of market	1	0	0	0	0	2.5
H	Obtaining credit	2	1	1	0	0	8.5
I	Other	0	1	1	0	0	3.5
	Sum	7	7	4	2	1	40

		Percentages of total qty of recycables										
		H	Ht	Hp	C	M	S	GO	I	O	Tot	Notes
	Pl	30	70	0	0	0	0	0	0	0	100	
	Bg	0	0	0	100	0	0	0	0	0	100	
	P/C	99	0	0	0	0	1	0	0	0	100	
	Gl	100	0	0	0	0	0	0	0	0	100	
	Me	33	0	0	0	0	0	19	19	28	100	
	Ba	68	0	0	16	0	0	0	0	16	100	
Tot (kg)				Actual quantity from different sources								
0	Pl	0	0	0	0	0	0	0	0	0	0	1
450	Bg	0	0	0	450	0	0	0	0	0	450	2
615	P/C	609	0	0	0	0	6	0	0	0	615	
2150	Br	2150	0	0	0	0	0	0	0	0	2150	
8752	Bot	8752	0	0	0	0	0	0	0	0	8752	3
23635	Me	7887	0	0	15	0	0	4575	4575	6583	23635	
2890	Ba	1960	0	0	470	0	0	0	0	460	2890	
38492	Tot	21358	0	0	935	0	6	4575	4575	7043	38492	
Adjust Tot1		21358	0	0	935	0	6	4575	4575	7043	38492	4
Location factor		56	100	100	70	100	100	10	0	10	36	
Adjust Tot2		11875	0	0	655	0	6	458	0	704	13697	5
Qty	kg/d	390	0	0	22	0	0	15	0	23	450	
Notes:	%	86.7	0.0	0.0	4.8	0.0	0.0	3.3	0.0	5.1	100.0	

1. Pl quantities mainly relate to barrels/containers that are reused - don't include
2. One bag weighs 0.1 kg
3. One bottle weighs 0.66 kg (avg weight of 10 beer and arrack bottles) - assume same source distribution for bottles and broken glass.
4. Adj1 - adjust total to a/c for a total o 7 middlemen in Matale with only 7 being surveyed
5. Adj2 - adjust Adj1 to a/c for 36 % of materials collected within MMA (assume applies to all categories

a. Assume 100 % for Ht, Hp and M - no impact as qtys from these sources are zero.
b. Assume 100 % for S - factor has negligible impact as qty is so small.
c. Assume 0 % for I - as only industry within Matale is sawmills, lime kilns and chocolate factory which will not be sources of metal materials
d. Assume 70 % for C - as active commercial sector in Matale + Matale is reasonably close to other urban centr
e. Assume 10 % for GO - qty of metal wastes obtained from this source is large - expect most of this to come from outside MMA
f. Assume 10 % for O - mainly garage - many garages on main roads into and out of Matale
g. Get household total by difference= 56 % or 11875 kg/mth

Data indicates 100% of glass comes from households & 99% of P/C - expect 85 % of this to come from households within Matale = 9784 kg/mth - hence above figure is considered reasonable

3.5 Compost Barrel Survey

Findings from Matale - Compost Barrel Survey

A questionnaire survey was conducted among 76 households who either received or bought compost barrel in Matale Municipal Areas, in order to gather;

- Present situation of composting.
- Indication to the development of home composting.

Period of survey: July 2, 2002 to July 4, 2002
Sample size: 76
Sampling areas: Various areas.
Information on distributed areas was collected from municipal development officers.

Survey Results :

Q. Are you still using the compost barrel? Yes/No

a	Yes	34
b	No	28
c	Never used	14
	Total	76

Q. Average property and garden size

(perches)	Using	Stopped	Total
Property area	17.7	15.0	16.3

(perches)	Using	Stopped	Total
Garden area	7.7	7.8	7.7

Q. Why did you decide to get a compost barrel? *(Multiple answer)*

		Using	Stopped	Total
a	Compost barrel cost was low	0	0	0
b	Compost barrel appeared easy to use	12	5	17
c	Compost barrel looked like it would not attract pests	0	0	0
d	Compost barrel would not take up much space	8	4	12
e	Council offered education/training in how to use it	0	1	1
f	Compost making is recommended by Municipal Officers/workers	25	32	57
g	Interested in producing compost for use in own garden	15	9	24
h	Hoping to increase income, through making compost for own use/sale	8	4	12
i	Composting is good for the environment – it reuses/recycles waste	18	8	26
j	Other	0	1	1
	Total	86	64	150

Q. Did you receive any education/information on how to use the barrel? Yes/No

a	Yes	67
b	No	9
	Total	76

Q. If no, how long did you use it for?

a	Never used	14
b	Less than 1 month	7
c	More than 1 month but less than 3 month	8
d	More than 3 month but less than 6 month	4
e	More than 6 month but less than 12 month	4
f	More than 12 month but less than 18 month	3
g	More than 18 month but less than 2 years	2
h	More than 2 years	0
i	Irrelevant	34
	Total	76

Q. If you have never used the compost barrel or have stopped using it, why is this? (*Multiple answer*)

		Stopped	Never used	Total
a	Lack of knowledge on how to make compost	0	2	2
b	Composting takes too much time	2	2	4
c	Not enough space on site	10	5	15
d	Too much water gets into the bin	3	0	3
e	Odor problems	13	5	18
f	Pest problems	20	6	26
g	Bin has rusted badly	4	1	5
h	Lost interest	4	3	7
i	Compost takes too long to make	0	0	0
j	Compost product was poor in quality	0	0	0
k	Neighbors said something against	0	0	0
l	Other	2	0	2
	Total	58	24	82

Q. During use, how much compost did you produce on average per month?

(Kg.)	Using	Stopped	Total
Average production per month	6.9	3.0	5.2

Q. How do you think the Council's home composting programme might be improved? (*Multiple answer*)

		Using	Stopped	Total
a	Use of non-rusting container	20	15	35
b	Improved design of compost system	8	17	25
c	Improved training / education of household users	9	9	18
d	Council to give container for free	15	14	29
e	Information on who to contact for help / advice	7	6	13
f	Regular inspection by council staff	14	12	26
g	Other	0	3	3
h	No comments b/c don't like anyway	1	3	4
	Total	74	79	153

3.6 Other Information

Findings from Labor Line Survey in Matale

A questionnaire survey was conducted among 50 households in Municipal labor line in Matale, in order to gather a Basic socio-economic profile of inhabitants of Municipal labor line.

Period of survey: Fourth week of October, 2002
Sample size: 50 households in Higgolla

Q1 *Ethnicity*

		Matale	
		Number	%
a	Sinhala	0	0%
b	Muslim	0	0%
c	Tamil	50	100%
d	Other	0	0%
	Total	50	100%

Q2 *Religion*

		Matale	
		Number	%
a	Buddhist	0	0%
b	Islam	0	0%
c	Hindu	49	98%
d	Christian	1	2%
e	Other	0	0%
	Total	50	100%

Q3 Language Abilities

	Tamil		Sinhala	
	Number	%	Number	%
Can not communicate	0	0%	2	4%
A little bit of daily conversation	0	0%	12	24%
Can speak	15	30%	30	60%
Can speak, read and write a little bit	15	30%	6	12%
Can speak, read and write well	20	40%	0	0%
Total	50	100%	50	100%

Note: Four out of five survey assistants are Sinhala speaker, and the fact itself chooses interviewees who speak better Sinhala.

Q4 Household Size

(person)	Matale
Avg. number of household members	5.1

Q5 Monthly Income and Income Sources

(Rs.)	Avg. household income	Income per person
Matale	8,205	1,603

	Matale	
	Number	%
Municipal waste collection labor	58	60%
Government / Municipal Council works other than waste collection	0	0%
Private sector	4	4%
Manufacturing, other than the garment industry	0	0%
Small scale manufacturing	3	3%
Garment industry	1	1%
Education	2	2%
Transport	2	2%
Security forces	0	0%
Tourism	0	0%
Foreign employment	1	1%
Agriculture / Fishery	0	0%
Construction	6	6%
Health	0	0%
Domestic work	0	0%
Communications	1	1%
Pension	4	4%
Other	14	15%
Total	96	100%

Note: Other means "wage labors who engage in various kinds of works."

Q6 Housing Quality

		Matale	
		Number	%
a	Separate house	6	12%
b	Single line room	35	70%
c	Back to back line room	9	18%
d	Room of a house	0	0%
e	Other	0	0%
	Total	50	100%

	Floor	Number	%	**Walls**	Number	%	**Roof**	Number	%
1	Cement	41	82%	Brick / concrete	38	76%	Tile	35	70%
2	Floor tiles	0	0%	Sheets	0	0%	Corrugated iron	14	28%
3	Wooden	0	0%	Wattle & daub	12	24%	Asbestos sheet	1	2%
4	Earth	9	18%	Wooden	0	0%	Cadjan (coconut leafs)	0	0%
5	Other	0	0%	Other	0	0%	Other	0	0%
	Total	50	100%	Total	50	100%	Total	50	100%

Q7 *How long has your household lived in this house?*

		Matale	
		Number	%
a	Less than 5 years	2	4%
b	5 - 10 years	3	6%
c	10 - 15 years	14	28%
d	15 - 20 years	16	32%
e	More than 20 years	15	30%
	Total	50	100%

Community Focus Group Discussion 1

Name of the Municipality:	Matale Municipal Council
Area name:	Dole Rd.
Date & Time:	2002/07/02, 10:00 – 11:30

Precipitants:

1. Mr. G.Abeyratne (PHI- Matale MC)
2. Ms. W. Brankotu (CDA - Matale MC)
3. Ms. M. Oishi (JICA study team)
4. Ms. S. Seneviratne (JICA study team)
5. Mr. A. Kalyanaratne (Asst.- JICA study team)
6. Mr. S. Sasikumar (Asst.- JICA study team)
7. Twelve female residents of Dole Rd, Matale

1. Opinions about present situation of garbage collection

1.1 Identified main problems

1) Garbage dispersion by dogs, goats, and chicken
2) Improper disposing of garbage by people
3) Improper sweeping by MC road sweepers

1.2 Proposed solutions / suggestions

1) a. Dogs should be tied by rope.
   b. Killing stray dogs
   c. Proper maintenance of goats (It should be done by the owners)
2) a. Awareness program for people
   b. Implementing very strict laws (By MC)
   c. Announcing laws and punishment with regard to the garbage disposal
   d. Regular supervision by MC

2. Opinions about proposed garbage collection

1. Dust bin with a chain

   All of them are very much willing to cooperate with it. But it should have a proper guard; otherwise they are so sure that children or youngsters will break it or will steal. But if residents pay half of the cost of the bin, then it may have a secure because, they have an idea that they are their own property.

2. All of them are willing to get responsibility with regard to road sweepings around their houses. Already some of them are practising it.
3. All of them are willing to put garbage on time to the bin (e.g. before 8 O' clock) once it becomes well-known rule.

4. Quite many participants are willing to cooperate with direct disposing to the compactor. But people who live interior from the main roads shows hesitation. They think it would be so far for them. Those people said that the communal bin system might be easier for them.

Community Focus Group Discussion 2

Name of the Municipality:	Matale Municipal Council
Area name:	Malwatte Rd.
Date & Time:	2002/07/04, 10:15 – 11:30

Precipitants:
1. Ms. G. G. N. Amanalatha (CDA - Matale MC)
2. Ms. M. Oishi (JICA study team)
3. Ms. S. Seneviratne (JICA study team)
4. Mr. A. Kalyanaratne (Asst.- JICA study team)
5. Mr. S. Sasikumar (Asst.- JICA study team)
6. Nine female and two male residents of Malwatte Rd., Matale

1. Opinions about present situation of garbage collection

1.2Identified main problems

4) Bad condition of present collection bin
   - ① There is no outlet or hole to discharge rain water from these bins
   - ② Too smelly and a lot of worms
   - ③ Garbage in the bin is not collected daily
   - ④ Some people put even dead animals(dogs and cats) into these bins
5) Stray dogs diffuse garbage everywhere
6) Improper garbage collection by municipal laborer

1.2 Proposed solutions / suggestions

1) The bin should be large enough and with a door and water outlet. If there is a door for the bin, it will be easy for garbage collectors, and number of bins should be increased. Daily collection is ideal.
2) Awareness program for garbage generators is very important. It can be done through the CDAs easily. And also municipal council can distribute leaflets or notices with regard to rules and regulation of waste disposal. They consider that strict rules are necessary immediately to improve the situation.
3) Controlling stray dogs
4) Applying detergent for the bins until removal of garbage
5) Distributing compost barrel for households, it may help reduce garbage amount.

2. Opinions about proposed garbage collection

1. In this community, they prefer bell collection system than communal bin system, if collection vehicles come punctually. Since once a common place is set, some of them start discharging there garbage improperly, it is much better to keep own garbage until vehicle comes.
2. They said the communal bin system is also good. But it is sure that it works only when the strict rules and regulation exist. If there is such rules and regulation, even people living near by the collection point can supervise if there are some people who are not following rules.
3. All of them are willing to get responsibility with regard to road sweepings around their houses. Already some of them are practising it.