

### 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
<i>e.g. Cardboard</i>	<i>C (75%)</i>	<i>M (15%)</i>	<i>Ht (5%)</i>	<i>S, GO (5%)</i>

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
<i>e.g. Clean, sorted plastics</i>	<i>80kg/mth</i>	<i>5Rs/kg</i>	<i>400 Rs</i>	<i>Yes</i>	<i>Greater</i>
<b>Total payment</b>					

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
<i>e.g. Plastic pellets</i>	<i>50kg/mth</i>	<i>40Rs/kg</i>	<i>2,000</i>	<i>Medium</i>
<b>Total income:</b>				

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 = 2<sup>nd</sup> 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 = 2<sup>nd</sup> worst, etc.*)

	<i>Tick</i>	<i>Rank</i>
(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					3.1																				
ID No	Business name	Address/location	Opn Yrs	Main activities	Plastics					Polythene					Bags										
					MU	SU	CS	Oth	Tot	MU	SU	CS	Oth	Tot	PS	FB	PFB	SB	Oth	Tot					
MM1	Not known	K.Kanagasundari, 314 Matale Rd, Katugastota	1	collecting & selling of recyclable items	Y																				
MM2	Sarvo Traders	K.Saravana Kumar, 69 Katugastota Rd, Kandy	1	collecting & selling of recyclable items																					
MM3	Susila Stores	S.S.Ganeshan, 25 Katugastota Rd, Kandy	15	collecting & selling of recyclable items				Y	Y																
MM4	Kamala Stores	M. Pupalan, 495 Peradeniya Rd, Kandy	20	collecting & selling of recyclable items																					
MM5	Ganei Stores	H.M.M. Ashrop Alli, 04 Matale Rd, Katugastota	40	collecting & selling of recyclable items																					
MM6	Parana Yakada Kadaya	G Nisardeen, 57 King St, Kandy	45	collecting & selling of recyclable items																					
MM7	New Vijaya Metal	G.A.Sami, 229 Colombo St, Kandy	8 mts	collecting & selling of recyclable items				Y	Y								Y	Y		Y				Y	Y
MM8	New Kala Traders	K.P.Muttusami, 211/4 Colombo St, Kandy	17	collecting & selling of recyclable items						Y	Y			Y			Y	Y		Y					Y
MM9	(Akka Kade)	P. Puwana, 51/3 Yatinuwara St, Kandy	20	collecting & selling of recyclable items																					
MM10	Sinniya Stores	P.Ganeswarem, 56 Yatinuwara St, Kandy	40	collecting & selling of recyclable items																					
MM11	S.A.Traders	A.S.M.Ishak, 55 Yatinuwara St, Kandy	27	collecting & selling of recyclable items													Y	Y		Y	Y				Y
MM12	Jeewa Trading Co	R.Sammugeraja, 35 Aliyagiya Mw, Kandy	20	collecting & selling of recyclable items																					
Total	Total number of middlemen surveyed		12		No	1	0	0	3	4	0	1	2	0	2	1	3	1	2	0	3				

#### Notes:

1. Tri Star Plastics is more a manufacturing enterprise - listed separately below
2. NA = no answer; IR = irrelevant
3. There are believed to be 8 other middlemen shops that were not interviewed during this survey: 1 other shop in Katugastota, "Soysa shop" referred to in collection worker survey, 1 in New St, and 5 other shops in Alimudukkuwa

#### Recycling Factory

1					2 3.1																				
ID No	Business name	Address/location	Opn Yrs	Main activities	Plastics					Polythene					Bags										
					MU	SU	CS	Oth	Tot	MU	SU	CS	Oth	Tot	PS	FB	PFB	SB	Oth	Tot					
MM13	Tri star Plastic Industries	2 Haugahayattetenna, Hadessa, Kandy	10-12	recycling & processing & polythene prod'n	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y



ID No	Bags (%)				Paper/cardboard (%)								Glass (%)						Metals (%)						Batteries (%)						Prop (%)	3.4 Collection area (%)				
	H	Ht	Hp	O	H	Ht	Hp	C	M	S	I	O	H	Ht	Hp	M	I	O	H	Ht	Hp	C	GO	I	M	O	H	Ht	Hp	M		O	A	B	C	D
MM1													60	20	0	0	0	20	0	0	0	0	0	90	0	10					2.1	40%	0%	0%	60%	
MM2					100	0	0	0	0	0	0	0	100	0	0	0	0	0	30	0	0	0	0	0	70	100	0	0	0	0	1.3	60%	40%	0%	0%	
MM3					0	0	0	40	20	30	0	10							30	0	0	5	0	60	0	5	60	0	0	0	40	7.9	95%	5%	0%	0%
MM4					90	0	0	0	0	10	0	0	100	0	0	0	0	0	80	0	0	0	0	20	0	0					4.7	90%	10%	0%	0%	
MM5					80	0	0	0	0	0	0	20	80	0	0	0	0	20	80	0	0	0	0	0	0	80	0	0	0	20	2.4	60%	40%	0%	0%	
MM6																			75	2	0	0	3	0	0	20					0.1	40%	60%	0%	0%	
MM7					75	0	0	25	0	0	0	0	30	0	10	0	0	60	40	0	0	0	0	0	60					22.7	10%	0%	0%	90%		
MM8	40	20	10	30	40	20	10	0	0	0	0	30	40	20	10	0	0	30	40	20	10	0	0	0	30	40	20	10	0	30	25.4	60%	0%	40%	0%	
MM9					85	0	0	0	15	0	0	0	85	0	0	15	0	0	85	0	0	0	0	15	0	85	0	0	15	0	2.9	100%	0%	0%	0%	
MM10													50	0	0	0	50	0	50	0	0	0	50	0	0					15.8	80%	20%	0%	0%		
MM11					100	0	0	0	0	0	0	0	100	0	0	0	0	0	100	0	0	0	0	0	0	100	0	0	0	0	6.3	100%	0%	0%	0%	
MM12					10	0	0	0	0	0	5	75	10																	8.3	0%	50%	25%	25%		
Total	40	20	10	30	64	2	1	7	4	5	8	8	72	4	2	2	6	14	55	2	1	0	0	20	1	20	78	3	2	3	15	Avg	54%	10%	12%	24%
Sum =	40	20	10	30	43	0	0	2	1	4	43	7	68	1	0	2	26	3	52	1	0	1	0	28	1	16	95	0	0	4	1					
Sum =	100				Sum =	100					MM11: O = press	Sum =	100					Sum =	100						Sum =	100										

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

	Pl	Po	Bg	P/C	Glass			Me	Ba
					Br	Bo	Tot		
MM1	0	0	0	0	200	500	530	1650	0
MM2	0	0	0	100	300	300	498	637.5	300
MM3	0	0	0	500	0	0	0	1550	0
MM4	0	0	0	200	1000	1400	1924	3100	0
MM5	0	0	0	200	1000	1000	1660	550	50
MM6	0	0	0	0	0	0	0	200	0
MM7	0	0	0	300	0	200	132	1500	0
MM8	25	0	2250	350	0	250	165	350	0
MM9	0	0	0	50	2000	500	2330	1000	200
MM10	0	0	0	0	0	13500	8910	350	0
MM11	0	0	0	5000	0	2000	1320	400	200
MM12	0	0	0	9000	0	0	0	0	0
Total	31	0	2250	15700	4500	19650	17469	11288	750
	no	kg	no	kg	kg	no	kg	kg	kg

One bottle weighs 0.66 kg  
 Total glass = kg broken glass + no of bottles x wt of one bottle  
 Must adjust this table after entering data to eliminate any values for which there is NA in Q3.3 (indicated by blue shaded cell) do manually. Adjusted cells shaded orange

"Prop" column lists prop'n of materials collected from diff sources, as calculated in purchases sheet - used for calculating wt'd averages in Q3.4

MM1: tendered items  
 MM12: BOI (75%); other cities 25%; BOI are from both within Kandy district and elsewhere - assumed 50% within Kandy district and 25% outside

ID No	Bags (%)				Paper/cardboard (%)								Glass (%)						Metals (%)						Other (%)						3.4 Collection area (%)									
	H	Ht	Hp	O	H	Ht	Hp	C	M	S	I	O	H	Ht	Hp	M	I	O	H	Ht	Hp	C	GO	I	M	O	H	Ht	Hp	M	O	A	B	C	D					
MM13																																					35%		0%	65%

35% Kandy and surround (A & B)



4. Worker details										5.1 Processing							5.2 Products	5.3 Customers									
ID No	Manager/owner			Full-time workers			Part-time workers			Total H/mth	Equip FT	PI	Po	Ba	Pa	Gl	Me	Oth	Products	PI	Po	Ba	Pa	Gl	Me	Oth	
	No	Hr/wk	d/mth	No	Hr/wk	d/mth	No	Hr/wk	d/mth																		
MM1	2	84	26				2	84	20	312	1.5	R	IR	IR	WS	WS	WS	NA									
MM2	1	15	25							294	1.4	IR	IR	IR	R/WS	R/WS	R/WS	R/WS		NA	IR	IR	IR	In	In,WS	CE,WS	NA
MM3	1	72	26				1	4	2	269	1.3	R	IR	IR	R	R	WS	NA		IR	IR	IR	In	In	CE	CE	NA
MM4	1	72	26	1	72	26	2	16	2	539	2.6	IR	IR	IR	R/WS	R/WS	WS	NA		IR	IR	IR	In	In	WS	NA	NA
MM5	3	80	26							297	1.4	IR	IR	IR	R/WS	R/WS	R/WS	R/WS		IR	IR	IR	In	In	CE	NA	NA
MM6	1	56	26							208	1.0	IR	IR	IR	IR	IR	A	IR		IR	IR	IR	IR	IR	In	In	IR
MM7	1	56	25							200	1.0	NA	NA	NA	NA	NA	A	NA		NA	NA	O	In	In	F	NA	NA
MM8	1	51	25							182	0.9	B/E	NA	NA	D	B	A	NA		IR	IR	In,CE	In,CE	In,CE	In,F	In	O
MM9	2	80	26	1	70	26	1	1		557	2.7	IR	IR	IR	A	A	A	A		IR	IR	IR	O	O	O	O	O
MM10	2	130	27							501	2.4	IR	IR	IR	IR	R	NA	IR		IR	IR	IR	IR	In,CE	In,CE	IR	IR
MM11	3	200	30				1	25	25	946	4.6	IR	IR	IR	R/WS	R/WS	R/WS	NA		IR	IR	IR	In	In	In	In	NA
MM12	2	112	25	2	112	25	2	6	4	803	3.9	IR	A	A	A	R/WS	R/WS	R/WS		IR	NA	NA	In	In	In	In	NA
Total	20			4			9			5109	24.6																
Assume Equiv FT worker = 208 h/mth in private sector (8h/d x 26d/mth)										R = retail	2	0	0	5	6	3	2		In	2	1	1	9	8	5	2	
Notes:										WS = wholesal	0	0	0	5	5	6	2		CE	0	0	1	1	3	4	1	
MM1 & MM3: 7 but seems too low - 26 used as more reasonable										A	0	1	1	2	1	5	2		T	0	0	0	0	0	0	0	
MM6: >25 - use 26										B	1	0	0	0	1	0	0		F	0	0	0	0	0	2	0	
MM11: NA for PT workers d/mth - assumed 25 based on d/wk										C	0	0	0	0	0	0	0		Oth	0	0	1	1	1	1	1	
MM12: Variable for PT workers - assumed 4 based on d/wk										D	0	0	0	1	0	0	0		IR	8	8	8	2	2	0	2	
										E	1	0	0	0	0	0	0		NA	1	2	1	0	0	0	5	
										NA	1	2	2	1	1	1	6		Sum	11	11	12	13	14	12	11	
										IR	8	9	9	2	2	0	2		Use "In" for individuals								

4. Worker details										5.1 Processing							5.2 Products	5.3 Customers									
ID No	Manager/owner			Full-time workers			Part-time workers			Total H/mth	Equip FT	PI	Po	Ba	Pa	Gl	Me	Oth	Products	PI	Po	Ba	Pa	Gl	Me	Oth	
	No	Hr/d	d/mth	No	Hr/d	d/mth	No	Hr/d	d/mth																		
MM13	2	24	26	37	444	26	22.5	180	20	15788	75.8	C/D	C/D														
MM13: 20-25 PT workers										Pellets,bags,polythene,bangles, toys, suitcase handles,nursery bags																	

ID No	Name, location, distance (km)	5.5 Profit			Exp and income check			5.6 Main costs										
		Expenditure	Income	Net income	Recycl Payments	Recycl Sales	Net income	A	B	C	D	E	F	G	H	I	Other =	
MM1	Akkage kade, Alimudukkuwa, 5km	10000	15000	5000	22700	28500	5800	1		3	5		4	2				
MM2	Kandy	20000	23000	3000	10350	14325	3975	1	3		2		4	5				
MM3	Akkage kade, Alimudukkuwa, 1.5km	20000	28000	5000	25900	38070	12170	1		4	3		5		2			
MM4	within city limits	30000	40000	10000	38700	45700	7000	1			2			3		3		
MM5	I=Katugastota CE=Kandy-5km	15000	20000	5000	16100	22000	5900	1	2				3					
MM6		17500	NA	NA	2500	4000	1500	1		4			2			3		
MM7	S.R.Metal Wattala	NA	NA	NA	33300	53300	20000	1	2					3				
MM8	Colombo, 115Km	50000	NA	10%	20075	25675	5600	1	4		3		2					
MM9	Piter, Wattala, Raja Stores, Paliyagoda (110km)	30000	40000	10000	13080	18330	5250	1		2	3		4		5			
MM10	Kandy	65000	70000	5000	55750	69775	14025	1					3	2				
MM11	Kandy	150000	170000	20000	105200	119200	14000	1			3		4	2				
MM12	Kandy, Colombo, 115Km Piter-(Fe) Misharan Co.- (Pa,CB), small ind. (AI,B)	65000	75000	10000	45000	75000	30000	2	5	1	3					4	l = tax	
Total		Total	472500	NA	NA	388655	513875	125220										

From recyclables purchases and sales data

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	11	0	1	0	0	0	0	0
2	2	1	2	1	2	0	2	3	1
3	1.5	0	1	1	5	0	2	2	0
4	1	0	1	2	0	0	4	0	1
5	0.5	0	1	0	1	0	1	1	0
Sum	12	5	5	8	0	9	6	2	3
Wt avg	29.5	7	8	12	0	11.5	9.5	2.5	4

MM4: A = 60%, D = 20%, G=10%, I=10%

ID No	Name, location, distance (km)	5.5 Profit			Exp and income check			5.6 Main costs										
		Expenditure	Income	Net income	Recycl Payments	Recycl Sales	Net income	A	B	C	D	E	F	G	H	I	Other =	
MM13	See below	583000	NA	NA	356250	537500	181250	2			2	2	1					

Mony & Co, Sridharan stores Kandy, Amir Stores Kurunegala, Diamond Plastic Colombo, Lanka polythene Kadawatha, Paramon plastic Colombo, Rasak stores Matale, Walimadastors Wallimada, Barakath, Topstar Colombo, Lanka polythene Kadawatha, Paramon plastic Colombo, Rasak stores Matale, Walimadastors Wallimada, Barakath, Topstar Colombo

Expenses:  
 buying recyclables = 356250  
 labour = 295650 (Equiv FT workers x 150Rs/d x 26d/mth)  
 Total 651900  
 Suspect total expenditure understated, as above calc's exceed this + don't allow for electricity - their biggest cost.

MM13: F=70%

ID No	6.1	6.2	6.3									6.4 & 6.5
	Qty (kg/mth)	Action	Main problems									Comments on what could be done to help solve these problems + Other
			A	B	C	D	E	F	G	H	I	
MM1	150	C	1		2	3			5	4		Better market, low interest credit facilities
MM2	75	B	1		2							Open large collection centre in Kandy
MM3	300	B	1		2			4		3	5	Low interest credit facilities, reduce trade licence fee, better market, purchasing centre in Kandy
MM4	90	B			4			1				2,3,5 Storage facilities, financial aids, low interest credit facilities
MM5	60	B	1					2		3		Provision of iron baling machine to start iron processing, better market for plastics
MM6	125	D		4	3		2		5		1	
MM7	50-60	D	1		2		4		5		3	Credit facilities, better market with government involvement
MM8	60	D	2		3			4	1	5		Credit facilities
MM9	80	NA	2			3				4		Training regarding recycling
MM10	15	NA			2					1	3	Credit facilities from government banks
MM11	30	B	1		2					4	3	Financial assistance, buying center in Kandy
MM12	No	NA	2		3	4			5	1		

Total											
	Rank	A	B	C	D	E	F	G	H	I	
1	2.5	6	0	0	0	0	1	1	2	1	
2	2	3	0	6	0	1	1	0	0	0	
3	1.5	0	0	3	2	0	0	0	2	3	
4	1	0	1	1	1	1	2	0	3	0	
5	0.5	0	0	0	0	0	0	4	1	1	
	Sum	9	1	10	3	2	4	5	8	5	
	Wt avg	21	1	18	4	3	6.5	4.5	12	7.5	

Notes:  
Better market = higher prices for recyclables

MM4: 1 = transport problems; sell items for debt; difficult job  
MM9: 1 = legal problems (police)

ID No	6.1	6.2	6.3									6.4 & 6.5
	Qty (kg/mth)	Action	Main problems									Comments on what could be done to help solve these problems + Other
			A	B	C	D	E	F	G	H	I	
MM13	10-15% (of inputs)	C	4	4				1		2	3	Provide subsidies and a building Govt encouragement is poor; electricity & space problems; no cooperation

3.4.3 Result 2

Section	1		3.1		3.5		Plastics										Polythene										Bags										Newspaper									
ID No	Business name	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD														
MM1	Not known	MU		NA																																										
MM2	Sarvo Traders																									100	kg	12	/kg	1200	Y	>														
MM3	Susila Stores	Oth	6	Cont.		NA		NA	NA																350	kg	14	/kg	4900	NA	NA															
MM4	Kamala Stores																								100	kg	13	/kg	1300	Y	=															
MM5	Ganei Stores																								200	kg	15	/kg	3000	Y	>															
MM6	Parana Yakada Kadaya																																													
MM7	New Vijaya Metal	Oth	5	Barr	800	ea	4000	NA	NA									Var	8500	Bags	2.5	ea	13750	Y	>	300	kg	17	/kg	5100	Y	>														
MM8	New Kala traders	Oth	25	Cont.	11	ea	275	No	<	BU/SC		NA						Var	2250	Bags	5	ea	11250	N	>	350	kg	16	/kg	5600	N	>														
MM9	(Akka Kade)																								20	kg	14	/kg	280	Y	=															
MM10	Sinnaiya Stores																																													
MM11	S.A.Traders																																													
MM12	Jeewa Trading Co									SC	500	kg	5	/kg	2500	Y	>	Var		NA						5000	kg	17	/kg	85000	Y	>														
	Total		36	Barr/cont			4275	Rs			500	kg			2500	Rs			7750	bags				25000	Rs	6420	kg			106380	Rs															

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. Tri Star Plastics is more a manufacturing enterprise - listed separately below
4. NA = no answer

Var = various  
MM8: said buy 1500 and sell 3000 bags  
- assume buy and sell 2250  
MM7: said buy 5000 & sell 6000 bags -  
assumed buy and sell 5500

MM8 said buy 300 & sell 400 kg n'paper  
- assume buy and sell 350

Section	1		3.1		3.5		Plastics										Polythene										Bags										Newspaper									
ID No	Business name	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Code	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD														
MM13	Tri Star Plastic	CS	17500	kg	12-15	/kg	236250	Y	<	CM	5000	kg	10	/kg	50000	Y	>	Var		NA																										
										MU	10000	kg	6-8	/kg	70000	NA	NA																													

MM13: 15-20T



Section	Metals - copper/brass															Metals - Aluminium															Batteries															Total quantities					Actual	Proportion 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	Cont-ainers	Bottles (no)	Bags (no)	Kg	Payments (Rs)																									
	MM1	100	kg	80	/kg	8000	Y	=	50	kg	50	/kg	2500	Y	=	300	kg	8	/kg	2400	Y	=	0	500	0	2150	22700	>	2.1																							
	MM2	37.5	kg	60	/kg	2250	Y	=	NA	NA	NA	NA	NA	NA	NA	300	kg	7	/kg	2100	Y	>	0	300	0	1338	10350	>	1.3																							
	MM3	50	kg	80	/kg	4000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	2000	0	2050	25900	>	7.9																							
	MM4	100	kg	90	/kg	9000	Y	>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0	1400	0	4300	38700	>	4.7																							
	MM5	50	kg	65	/kg	3250	Y	=	NA	NA	NA	NA	NA	NA	NA	50	kg	7	ea	350	Y	=	0	1000	0	1800	16100	>	2.4																							
	MM6		NA						NA	NA	NA	NA	NA	NA	NA	0							0	0	0	200	2500	>	0.1																							
	MM7		NA						NA	NA	NA	NA	NA	NA	NA	5							5	200	5500	1800	33300	>	22.7																							
	MM8		NA						NA	NA	NA	NA	NA	NA	NA	25							25	250	2250	700	20075	>	25.4																							
	MM9		NA						NA	NA	NA	NA	NA	NA	NA	0							0	500	0	3250	13080	>	2.9																							
	MM10		NA						NA	NA	NA	NA	NA	NA	NA	0							0	13500	0	350	55750	>	15.8																							
	MM11	100	kg	50	/kg	5000	Y	>	100	kg	50	/kg	5000	Y	>	200	kg	6	/kg	1200	Y	>	0	2000	0	5600	105200	>	6.3																							
	MM12								100	kg	50	/kg	5000	Y	>	NA	NA	NA	NA	NA	NA	NA	0	0	0	11600	45000	>	8.3																							
		438	kg			31500	Rs		250	kg			12500	Rs		1050	kg			7450	Rs		36	21650 (kg)	7750 (kg)	35138	388655		100.0																							

MM2: Said buy 25 and sell 50 - assume both 37.5

"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)

Section	Metals - copper/brass															Metals - Aluminium															Batteries															Total quantities					Actual
	ID No	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Qty	Unit	Price	Unit	Total	Dem	SvD	Cont-ainers	Bottles	Bags	Kg	Payments (Rs)																								
	MM13															0							0	0	0	32500	356250	>																							

3.4.4 Result 3

		1		3.1		5.4																							
ID No	Business name	Plastics						Polythene				Various bags				Newspaper													
		Code	Qty	Unit	Price	Unit	Total	Dem	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem								
MM1	Not known	MU		NA																									
MM2	Sarvo Traders																												
MM3	Susila Stores	Oth	30	Can	9	ea	270	Med																					
MM4	Kamala Stores																												
MM5	Ganei Stores																												
MM6	Parana Yakada Kadaya																												
MM7	New Vijaya Metal	Oth	5	Barrel	800	ea	4000	Med																					
MM8	New Kala Traders	Oth		NA					SU/SC		NA																		
MM9	(Akka Kade)																												
MM10	Sinnaiya Stores																												
MM11	S.A. Traders																												
MM12	Jeewa Trading Co								SC	500	kg		/kg	4000	High		NA												
	Total		35	Cont						500	kg			4000	Rs														
																7750	bags			44875	Rs			6420	kg			127420	Rs
																MM8: said buy 1500 & sell 3000 bags - assume buy and sell 2250				MM8 said buy 300 & sell 400 kg n'paper - assume buy and sell 350									
																MM7: said buy 5000 & sell 6000 bags- assumed buy and sell 5500				MM7 said buy 500 & sell 100 kg n'paper - assume buy and sell 300									

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. Tri Star Plastics is more a recycling industry - listed separately
4. NA = no answer

		1		3.1		5.4															
ID No	Business name	Plastics						Polythene				Various bags				Newspaper					
		Code	Qty	Unit	Price	Unit	Total	Dem	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem
MM13	Tri Star Plastic	Pellet	5000	kg	45-50	/kg	237500	High	Prod	30000	kg		/kg	300000							

MM13: avg sales price calc'd from data  
 The respondent said total income was 300000, but he couldn't really state the quantity or sales price. Above quantity is based on purchases figures but gives a very low sales price of 12Rs/kg - suspect the income is much larger than stated for products - otherwise, there is no point in making them.

ID No	Paper - exercise books						Cardboard						Broken glass						Glass - Arrack/beer/other bottles						Metals - ferrous							
	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	
MM1								NA					200	kg	2.5	/kg	500	Med	Arr/BB	500	Bott	5	ea	2500	Med	1500	kg	7	/kg	10500	Med	
MM2													300	kg	1.5	/kg	450	Med	Arr/BB	300	Bott	7	ea	2100	Low	600	kg	7	/kg	4200	Med	
MM3	150	kg	7.5	/kg	1125	Med								NA					Arr/BB	2000	Bott	7.5	ea	15000	Med	1500	kg	7.25	/kg	10875	Med	
MM4	100	kg	7	/kg	700	Med							1000	kg	2.5	/kg	2500	Med	Arr/BB	1400	Bott	7	ea	9800	Med	3000	kg	7	/kg	21000	Med	
MM5													1000	kg	2.5	/kg	2500	NA	Arr/BB	1000	Bott	7	ea	7000	Med	500	kg	7	/kg	3500	Med	
MM6																									2000	kg	20	/kg	4000	Med		
MM7		NA						NA						NA					Arr/BB	200	Bott	6	ea	1200	Med	1500	kg	7.5	/kg	11250	High	
MM8		NA						NA						NA					Arr/BB	250	Bott	5	ea	1250	Med	350	kg	8	/kg	2800	High	
MM9	30	kg	7	/kg	210	Med							2000	kg	3	/kg	6000	Med	Arr/BB	500	Bott	5	ea	2500	NA	1000	kg	7.5	/kg	7500	Med	
MM10														NA					Bottles	13500	Bott	var		67500	NA	350	kg	6.5	/kg	2275	Med	
MM11		NA												NA					Arr/B/Oth	2000	Bott	4.5-6.0	ea	10000	NA	200	kg	6	/kg	1200	NA	
MM12	1000	kg	3.5	/kg	3500	High	8000	kg	5.5	/kg	44000	High													2000	kg	8	/kg	16000	High		
																				21650	Bott											
	1280	kg			5535	Rs							4500	kg			11950	Rs						118850	Rs	12700	kg				95100	Rs

MM2 said buy 400 and sell 200 - assume 300  
MM7 said buy 300 and sell 100 - assume 200  
MM9 buys 500 bottles but no sales data -assume 500 @ 5Rs ea.  
MM10 bottle qty calculated based on given income and assumed sales price of 5 Rs ea - gives same qty as for purchases

MM6: said buy 250kg & sell 150kg -used 200  
MM7: sales qty not stated-used 1500 as per purchases sold @7.5 (markup = 1Rs)  
MM11: price quoted as 60Rs/kg - assumed 6

3-42

ID No	Paper - exercise books						Cardboard						Broken glass						Glass - Arrack/beer/other bottles						Metals - ferrous					
	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Code	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total
MM13																														



ID No	Metals - copper/brass						Metals - Aluminium						Batteries						Total quantities					Actual
	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Cont-ainers	Bottles	Bags	Kg	Sales (Rs)	
MM1	100	kg	90	/kg	9000	Med	50	kg	60	/kg	3000	Med	300	kg	10	/kg	3000	Med	0	500	0	2150	28500	>
MM2	37.5	kg	90	/kg	3375	Med		NA					300	kg	9	/kg	2700	Med	0	300	0	1338	14325	>
MM3	50	kg	90	/kg	4500	Med		NA											30	2000	0	2050	38070	>
MM4	100	kg	100	/kg	10000	>		NA											0	1400	0	4300	45700	>
MM5	50	kg	90	/kg	4500	>		NA					50	kg	10	/kg	500	Med	0	1000	0	1800	22000	>
MM6		NA						NA											0	0	0	200	4000	>
MM7		NA						NA						NA					5	200	5500	1800	53300	>
MM8		NA						NA						NA					0	250	2250	700	25675	>
MM9		NA						NA					200	kg	9	/kg	1800	Med	0	500	0	3250	18330	>
MM10		NA						NA											0	13500	0	350	69775	>
MM11		NA					100	kg	60	/kg	6000		200	kg	10	/kg	2000	NA	0	2000	0	5500	119200	>
MM12		NA					100	kg	75	/kg	7500	High							0	0	0	11600	75000	>
	338	kg			31375	Rs	250	kg			16500	Rs	1050	kg			10000	Rs	35	21650	7750	35038	513875	
MM2: Said buy 25 and sell 50 - assume both 37.5						MM11: No qty - assumed same as purchases (100) and allow for markup of 10Rs (sales price = 60)																		

ID No	Metals - copper/brass						Metals - Aluminium						Batteries						Total quantities					Actual
	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Qty	Unit	Price	Unit	Total	Dem	Cont-ainers	Bottles	Bags	Kg	Sales (Rs)	
MM13																			5000	0	0	25000	537500	

### 3.4.5 Data summary for graphs

Q3.3

	Main sources (%)						
	Plastic	Polythene	Bags	Paper/cardboard	Glass	Metals	Batteries
Households	32.3	40.0	40.0	43.0	68.3	52.2	94.7
Hotels	16.1	20.0	20.0	0.4	0.8	0.7	0.0
Hospitals	8.1	10.0	10.0	0.2	0.2	0.3	0.0
Commercial	19.4	0.0	0.0	1.8	0.0	0.7	0.0
Markets	0.0	0.0	0.0	0.7	2.0	1.3	4.0
Schools	0.0	0.0	0.0	3.9	0.0	0.0	0.0
Government offices	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Industries	0.0	0.0	0.0	43.0	25.5	28.4	0.0
Other	24.2	30.0	30.0	7.0	3.2	16.3	1.3
	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Q5.6

	Rank	1	2	3	4	5	Wt avg
A	Purchases	11	1	0	0	0	29.5
B	Storage	0	2	1	1	1	7
C	Transportation	1	1	1	2	0	8
D	Labour	0	2	5	0	1	12
E	Other raw materials	0	0	0	0	0	0
F	Utilities	0	2	2	4	1	11.5
G	Land/building rental	0	3	2	0	1	9.5
H	Machinery maintenance	0	1	0	0	1	2.5
I	Other	0	0	2	1	0	4
	Sum	12	12	13	8	5	84

Q6.3

	Rank	1	2	3	4	5	Wt avg
A	Shortage of recyclables	6	3	0	0	0	21
B	Contamination/poor quality	0	0	0	1	0	1
C	High land/building rental costs	0	6	3	1	0	17.5
D	High transportation costs	0	0	2	1	0	4
E	Unstable demand	0	1	0	1	0	3
F	Utilities	1	1	0	2	0	6.5
G	Loss of market	1	0	0	0	4	4.5
H	Obtaining credit	2	0	2	3	1	11.5
I	Other	1	0	3	0	1	7.5
	Sum	11	11	10	9	6	76.5

		Percentages of total qty of recycables										Tot	Notes
		H	Ht	Hp	C	M	S	GO	I	O			
	PI	32	16	8	19	0	0	0	0	0	24	100	
	Po	40	20	10	0	0	0	0	0	0	30	100	
	Bg	40	20	10	0	0	0	0	0	0	30	100	
	P/C	43	0	0	2	1	4	0	43	7	100		
	Gl	68	1	0	0	2	0	0	26	3	100		
	Me	52	1	0	1	1	0	0	28	16	100		
	Ba	95	0	0	0	4	0	0	0	1	100		
<b>Tot (kg)</b>		<b>Actual quantity from different sources</b>											
0	PI	0	0	0	0	0	0	0	0	0	0	0	1
500	Po	200	100	50	0	0	0	0	0	150	500		
775	Bg	310	155	78	0	0	0	0	0	233	775	2	
15700	P/C	6748	70	35	275	108	620	0	6750	1095	15700	3	
4500	Br	3073	36	8	0	90	0	0	1148	146	4500		
14289	Bot	9758	114	24	0	286	0	0	3644	464	14289		
13388	Me	6987	88	42	92	178	0	7	3807	2187	13388		
1050	Ba	994	0	0	0	42	0	0	0	14	1050		
50202	<b>Tot</b>	<b>28069</b>	<b>562</b>	<b>236</b>	<b>367</b>	<b>703</b>	<b>620</b>	<b>7</b>	<b>15349</b>	<b>4288</b>	<b>50202</b>		
<b>Adjust Tot1</b>		<b>46782</b>	<b>937</b>	<b>393</b>	<b>612</b>	<b>1172</b>	<b>1033</b>	<b>12</b>	<b>25581</b>	<b>7146</b>	<b>83669</b>	<b>4</b>	
<b>Location factor</b>		<b>72</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>80</b>	<b>10</b>	<b>80</b>	<b>54</b>		
<b>Adjust Tot2</b>		<b>33793</b>	<b>750</b>	<b>315</b>	<b>489</b>	<b>938</b>	<b>827</b>	<b>9</b>	<b>2558</b>	<b>5717</b>	<b>45396</b>	<b>5</b>	
<b>Qty</b>	<b>kg/d</b>	<b>1111</b>	<b>25</b>	<b>10</b>	<b>16</b>	<b>31</b>	<b>27</b>	<b>0</b>	<b>84</b>	<b>188</b>	<b>1492</b>		
<b>Notes:</b>	<b>%</b>	<b>74.4</b>	<b>1.7</b>	<b>0.7</b>	<b>1.1</b>	<b>2.1</b>	<b>1.8</b>	<b>0.0</b>	<b>5.6</b>	<b>12.6</b>	<b>100.0</b>		

1. PI 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 of 20 middlemen in Kandy with only 12 being surveyed
5. Adj2 - adjust Adj1 to a/c for 54 % of materials are collected within KMA (assume applies to all categories)
  - a. Assume 10 % of materials from industry obtained inside KMA - rest from outside
  - b. Assume 80 % of Ht, Hp, C, M, S, GO & O from inside KMA
  - c. Get household total by difference

### 3.5 Other Information

#### Focus Group Discussion by Cleansing Workers

Name of the Municipality:	Kandy Municipal Council
Venue:	Kasugastota, KMC Zonal Office
Date & Time:	2002/06/06, 12:30 – 13:30
Precipitants:	<ol style="list-style-type: none"><li>1. Ms. M. Oishi (JICA study team)</li><li>2. Ms. S. Seneviratne (JICA study team)</li><li>3. Ten garbage collection workers.</li></ol>

#### General Information about informants

- There are 46 workers in zone 4 and all are now permanent workers.
- Participants are 7 female and 3 male workers. Ethnicity wise, 8 of them are Tamil and 2 of them are Sinhala.
- There is no rule or common practice on how long workers have to work to become permanent workers. It depends on political interferences. Recently all casual workers become permanent due to the latest elections.
- Working hours are from 6:30 to 14:30.
- Working days per week are 7 days by 4 workers, 6 days by 4 workers and 4 days by the other 2 workers.
- The monthly wage is about Rs.6,000 per month on average. Generally speaking two third of this amount is basic salary and one third is from official allowances.
- Those whose either father or mother had worked as garbage collection workers are six, and all of them are Tamil.

#### General Working Conditions

- As for the secondary jobs, only 4 to 5 out of 46 workers have the secondary occupation such as making shoes, housemaids, porters and so on.
- There might be some workers who receive small allowance from garbage generators, but they do not know exactly because those who receive some money never reveal such information. As for the attendees, they do not receive any money, but sometimes receive tea, sweets, left-outs and so on. Even they do not get money but they get special new year dishes in the new year season.
- They collect recyclable materials, such as galvanized steel, iron, aluminum, brass. Their prices are 1.5 Rs. per kg, 3 Rs. per kg, 50 Rs. per kg., 60 Rs. per kg respectively. They used to collect and sell cardboard, but now they don't collect since there is no buyer of cardboards now. For other

materials mentioned above, there is a buyer near Kasgustota Bridge.

- As for the working conditions and problems, all of them are not at all satisfied, and especially the following ideas were shared.
  - ◇ Tools for collection works such as carts and baskets are not enough and not well maintained.
  - ◇ There are no protecting clothing such as boots, gloves and apron at all, and no first aid kit in the zone office.
  - ◇ It is hard to carry the loaded cart up to bins. The number of bins is not at all enough.
  - ◇ Usually they work as a male-female pair, and if one of them is absent, only the other one have to finish their works by oneself.
  - ◇ Some male workers are drunk even in the working hours, but it is not a big problem since they finish their work as usual.
  - ◇ Unsanitary waste such as human waste and animal body are sometimes discharged.
  - ◇ People do discharge the waste anytime they want to, even right after they collected the garbage, and blame them for not cleaning properly.
  - ◇ People out of MC limit come to dispose their wastes.
  - ◇ Number of workers are not sufficient
- The following two areas are most difficult places to collect garbage
  - a) Kasgastota Town: The volume of the wastes is much higher than other areas.
  - b) Along the Kandy Street: The traffic along this road is high even while collecting the garbage.
- When they have problems regarding to their work, they consult with supervisors.

### **Hearing from minor supervisors**

- There is not sufficient number of workers. Once they tried to hire some more workers but applicants finally refuse to take the job due to the insufficient amount of wages.
- Now only 13 workers work on holidays, comparing to 20 workers before.
- The limited budget hinders them from modernizing equipments.

## Organizational Information Sheet

Interview date : 2002/06/13

Name of the organization:	Nation Builders Association
Name of the chairperson:	Mr. M. B. Adikaram ; Nandee Amarasinghe (Director)
Address and contact number:	New Town, Kundasale, Kandy Tel: +94-8-420332 Fax: +94-8-420332
Year of establishment:	1963

### 1. General information

- No. of personnel 250 full time staffs
- Fund resource International aid agencies such as WB, ADB and other bilateral aid agencies and international NGOs.
- Working area Mainly environmental activities and other community development programs.

### 2. Main activities

Following environmental activities have been carried out by this NGO.

1. Forestry conservation
2. Soil conservation
3. Watershed management
4. Waste water management
5. Community sanitation
6. Garbage disposal and compost making

### 3. Cooperation with other organizations

This NGO was an active member of "Environmental Committee" initiated by KMC. (Now this committee became inactive and has not held any meeting since last September.) As the fund resources shows, in addition to the close relationship with KMC, it has enough experience to work with other aid agencies in and out of Kandy.

### 4. Future cooperation with the pilot project of the study team

They understand both the importance of public cooperation in the field of solid waste management and the limitation of KMC in this field. They are willing to fill the gap and motivate communities. There are substantial possibilities to work with this NGO in pilot projects.

## Organizational Information Sheet

Interview date : 2002/07/11

Name of the organization:	Center for Development Alternative
Name of the chairperson:	Mr. S. Balakurishnan
Name of the interviewee:	Mr. Kamaru Kumara Kekurandara, Program Coordinator
Address and contact number:	582/10, Peradeniya Road, Kandy Tel: +94-8-236082 Fax: +94-8-236082
Year of establishment:	1982

### 1. General information

- No. of personnel 10 permanent staffs and about 300 volunteers
- Fund resource International aid agencies such as UNDP and other bilateral aid agencies, for example, CIDA and international NGOs such as Canadian WUS and Dutch ECO.
- Working area Mainly environmental activities

### 2. Main activities

Following environmental activities have been carried out by this NGO.

1. Environmental law and mediation
2. Environmental education
3. Recycling project

As for the recycling project, the program coordinator, in cooperation with environmental committee of some schools and environmental committee of local authorities, collects three kinds of plastic bags (low density, high density and pp) from commercial establishments such as textile industry and super markets and brings them to D.K.W. Plastics (Pvt.) in Hatton. Now he is trying to expand the program to schools and households.

### 3. Cooperation with other organizations

This NGO was an active member of "Environmental Committee" initiated by KMC. (Now this committee became inactive and has not held any meeting since last September.)

### 4. Future cooperation with the pilot project of the study team

They understand both the importance of public cooperation in the field of solid waste management and the limitation of KMC in this field. There are substantial possibilities to work with this NGO in pilot projects.

## Activities of Divisional Environmental Officers

Interview date : 2002/05/29

Name of the Municipality:	Kandy Municipal Council
Name of the officer:	Ms. Chathurani
Year of appointment:	1996
Address and contact number:	Health Department, Kandy Municipal Council. 08-223573

### 1. **Organizational arrangement** (which department do you belong to in municipalities)

At present, two Divisional Environmental Officers (DEOs) work under Health Department of KMC.

### 2. **Main activities**

#### 2.1 **School Program**

As mentioned in the main report, there are two school nationwide programs, namely "Eco Clubs" for elementary schools and "Environmental Pioneer Brigade (EPB)" Program for secondary schools, initiated by Central Environmental Authority. Eco Club started in 2001 and EPB Program have started since 1984. In Kandy, EPB programs are much more active than Eco Club program. The EPB program is voluntary and involves organizing school children in groups of twenty five. EPB program activities are based on a five-tier badge system: they are Pioneer badge, Green badge, Silver badge, Gold badge and Presidential badge.

The CEA has appointed "Divisional Environmental Officer" to each district, division and selected local authorities. KMC has received first DEO in 94 and second DEO in 96. DEOs take an active role to activate environmental education programs in cooperation with KMC and respective schools. In addition, the CEA has appointed "commissioners", selecting some teachers to be environment commissioners in each district and assistant environment commissioner in each division. At present, following 14 schools have participated in EPB programs.(see table 1 in the next page.) Among those 14 schools, Mahamaya Girls School, Senkadagala MV and Sri Rafula College are active. Environment commissioner is in Mahamaya Girls School and Assistant environmental commissioner is in Sri Rafula Colledge.



No.	Activeness	Name of School	No. of groups
1	◎	Mahamaya Girls School	4
2		Girls High School	2
3		Hillwood BMV	1
4		Gothami BMV	2
5		Viharamaha Devi BMV	1
6		St. Anthony's Girls Colledge	1
7	◎	Senkadagala MV	1
8		Rasindevi KV	1
9		Sarasavi Uyana MV	1
10		St. Anthony's Boys College	1
11		Dharmaraja College	1
12	◎	Sri Rafula Colledge	4
13		Sumangala College	1
14		Trinity College	1

## 2.2 Environmental Committee

This was established in 1995 by the initiative of the CEA. The meeting is supposed to be held monthly, but it is not functioning well since September 2000. Usually, participants are Mayor, municipal commissioner, MOH, council members, school teachers, NGOs, PHIs and so on.

## 2.3 Other activities

DEOs in KMC organize environmental programs on special occasion such as the International Environmental Day. Besides, they are in charge of handling the complaints regarding to the environmental conditions.

## Chapter 4

# Kandy Waste Stream Analysis

**WACS Results**

Category	No of residents	W. gen. (g/d)	WGR (g/cap.d)
High	185	123,307	666.5
Middle	162	75,429	465.6
Low	183	67,371	368.1
Total	530	266,107	502.1

**Average Waste Composition over 8 days - weights (g)**

Kandy WACS Results		food/kitchen	paper	textile	Plastic	Grass & Wood	Leather & Rubber	metal	glass	Ceramic & Stone	other	Total
	High	29,482	3,191	440	2,176	5,179	81	409	379	1,176	44	42,557
	Middle	19,925	2,526	385	2,027	4,455	257	384	417	421	99	30,896
	Low	36,332	2,124	525	1,591	3,682	159	303	505	1,827	68	47,116
<b>Average Waste composition over 8 days - wt %</b>												Wt (g)
High	69.28	7.50	1.03	5.11	12.17	0.19	0.96	0.89	2.76	0.10	100.00	123,307
Middle	64.49	8.18	1.25	6.56	14.42	0.83	1.24	1.35	1.36	0.32	100.00	75,429
Low	77.11	4.51	1.11	3.38	7.81	0.34	0.64	1.07	3.88	0.14	100.00	67,371
Wt avg	69.90	6.93	1.11	5.08	11.70	0.41	0.96	1.07	2.65	0.18	100.00	266,107

Household survey (150 respondents)	Q3.1 garb disp		5.9 others behaviour	Weighted no of responses to different methods of waste disposal for different waste types											Wt avg	Rev'd	Rev'd %					
	Main	Other		LA colln	Self-disp	Compost	Recycle	Open dump	Total	Fd/Ki	Paper	Textile	Plastic	Gr/Wd				Le/Ru	Metal	Glass	Ce/St	other
LA colln	118	15	130	97.4	97.4	97.4	97.4	38	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	97.4	914.6	61.7	61.7	60.6
Self-disp	25	45	58	29	29	29	29	73	29	29	29	29	29	29	29	29	29	29	334	23.9	23.9	23.4
Compost	1	10	0	10	0	0	0	14	0	0	0	0	0	0	0	0	0	0	24	6.1	4.9	4.8
Recycle	1	5	0	0	80	23	6	1	0	64	98	0	3	275	3.8	3.1	3.0	275	3.8	3.1	3.0	
Open dump	5	13	26	6.6	6.6	6.6	6.6	5	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	6.6	64.4	4.4	8.3	8.1
Total	150	88	214	143	213	156	139	131	197	231	133	136	1612	100	101.9	100.0	100.0	1612	100	101.9	100.0	
Weight	0.8	0.2						Q3.9														

**Notes:**

- Q5.9 generally supports Q3.1 results except for indicating open dumping is more common. Q3.1 result used in preliminary analysis, applying weights to main/other answers as shown
- For compost and recycle options, use answers from other questions as indicated, rather than 3.1.
- For those composting/recycling different materials, assumed 80 % of materials generated are recycled/composted - gives revised total shown in last column
- Open dumping rate considered to be too low based on observation + neighbours' comments - Q5.9 open dump % = 12.15 % - adjust wt avg figure above to be average of wt avg & this %

WACS survey (89 respondents)		Fd/Ki	Paper	Textile	Plastic	Gr/Wd	Le/Ru	Metal	Glass	Ce/St	other	Total
Wt avg		69.90	6.93	1.11	5.08	11.70	0.41	0.96	1.07	2.65	0.18	100.00
<b>Weighted no of responses to different methods of waste disposal for different waste types</b>												
LA colln (A,B,C,D)		77	48	13	58	41	14	23	19	14	14	78.9
Self-disp (F,F)		7	4	2	10	21	3	4	3	3	3	10.8
Compost (H)		3	2	0	0	3	0	0	0	0	0	3.3
Recycle (G)		0	20	0	0	0	0	0	8	0	0	2.1
Open dump (I)		5	3	0	3	4	0	0	0	0	0	4.9
Total		92	77	15	71	71	17	27	30	17	17	100

Answers shaded in yellow from separate question on composting & recycling

**Household survey data**

2.1&2.2 Garbage coll'n	No	%
Have and use	122	81.3
Have but don't use	26	17.3
Don't have	2	1.3
Total	150	100.0

**WACS survey data**

2.1&2.2 Garbage coll'n	No	%
Have and use	78	87.6
Have but don't use	11	12.4
Don't have	0	0.0
Total	89	100.0

**Household survey data**

3.8 Garden waste	No	%
Yes	99	66.0
No	51	34.0
Total	150	100.0

**Q4-5 to 4-8 Recycling**

Qns	Yes	No	Fd/Ki	Paper	Textile	Plastic	Gr/Wd	Le/Ru	Metal	Glass	Ce/St	other	Total
4.5/4.6 Individual collector	124	26	0	80	23	6	1	0	64	98	0	3	275
4.7/4.8 Take to shop	47	103	0	21	2	2	1	1	5	41	0	1	74
4.9 Comp ki &/or ga waste	24	126	10				14						

**Notes:**

- Household questionnaire listed paper and cardboard separately and "metal can" and "other metal" separately, whereas these items were a single category in WACS. Hence, as more responses were obtained for paper compared with cardboard, it was assumed total paper = paper (not paper + cardboard)
- Hence, as more responses obtained for metal can compared with other metal, it was assumed total metal = metal can (not metal can + other)
- Assume same people are both giving/selling things to collectors and taking things to shops so that total doing some recycling is max no from these 2 questions, not sum
- In Q3.9, 14 people said they compost garden waste - hence 10 must compost kitchen waste

**Conclusions:**

- The household survey results are considered more realistic than the WACS survey results, based on field investigations within the city and being based on more samples.
- It is also considered more realistic to assume that those composting/recycling do not do this for 100% of particular material.

For these reasons, household survey result's revised total in final column (shaded blue) has been adopted.

Adjusted WDR = 0.502 kg/cap.d from WACS data  
 This represents discharge + open dumping + on-site disposal = 92.2 % of total waste generation from below %  
 Waste generation rate = 0.545 kg/cap.d

Both the household and WACS surveys were undertaken in areas where 99%+ of 150 households were provided with a garbage collection service, as indicated by Q2.1 & 2.2 responses.

Discussions with KMC staff and plotting of collection routes indicated KMA service coverage is 75 % (approximately - range = 70-80%)

Hence, disposal method %s were adjusted to account for this as follows:

	Serviced	Unserviced	Total
% of KMA	75	25	100
LA collection	60.6	0	45.4
Self-disposal	23.4	59.5	32.5
Compost	4.8	12.2	6.7
Recycle	3.0	7.7	4.2
Open dump	8.1	20.6	11.2
	101.9	100.0	100.0

**Notes:**

- Assume for areas not provided with garbage collection service, waste is disposed of by other methods in direct proportion to the stated %s. For example, self-disposal in unserviced area =  $23.4 / (23.4 + 4.8 + 3.0 + 8.1) * 100\% = 59.5\%$
- Overall %s calculated as  $((\% \text{ serviced area}) \times (\text{disposal method \% in that area}) + (\% \text{ unserviced area}) \times (\text{disposal method \% in that area})) / 100\%$   
 e.g.  $\text{self-disposal} = (75 * 23.4 + 25 * 59.5) / 100 = 32.5\%$

**Collection worker recycling (data from collection worker survey)**

Item	KMC	Care Kleen	Total
No of workers collecting items for recycling	4	3	7
Total no of workers interviewed	25	8	33
Average income(Rs/mth)	141	224	155
% of those interviewed collecting recyclables	16	38	21
Total no of workers	222	72	294
% interviewed/total workers	11	11	11
Estimated total no of workers collecting recyclables	36	27	63

**Notes:**

1. Total no of KMC labourers = 205 normal + 17 assigned from IDP

**Collection worker - recycling quantities**

Item	No collecting		Qty	Units	Price	Units	Est total qty/mth
	KMC	Care Kleen					
Bottles	3	3	251	kg/mth	0.5 - 3.0	Rs ea	2240
Cardboard	0	1	90	kg/mth	3	Rs/kg	804
Ferrous	2	1	18	kg/mth	3 - 5	Rs/kg	161
Metal can	1	0	2	kg/mth	25	Rs/kg	18
Aluminium	2	1	6	kg/mth	40 - 70	Rs/kg	54
Brass	1	1	1.5	kg/mth	80	Rs/kg	13
Copper	1	0	0.5	kg/mth	60	Rs/kg	4
Total quantity	4	3	368.8	kg/mth			3294
Est. tot. qty collected by all labourers			3294	kg/mth			

**Notes:**

- Average weight of bottles (mainly beer and arrack) = 0.66 kg ea (average weight, based on measurements of 5 arrack and 5 beer bottles)
- No of bottles collected per month = 380 bottles/mth, converted to kg/mth using above average weight
- Care Kleen Manager stated in interview that HC workers collect around 2-3kg/d of cardboard and vehicles around 5-10kg/d of cardboard which they sell to traders in the area. The collection worker survey data found 1 CK labourer who said they collect 30kg/mth of cardboard. From observation in the area, many CK HC labourers are collecting relatively large quantities of cardboard - hence survey figure of 30kg/mth (1kg/d) adjusted to account for this to 90 kg/mth = 3 kg/d. This gives an additional ~500kg/mth of materials recycled which is considered reasonable.
- Overall quantity recycled = 110 kg/d, which is relatively small. However, household survey indicates lot of recyclables collected at discharge + MM survey indicates very few middlemen receive recyclables from collection workers. Assume correct.

Data Entry - Survey Around Kandy (GOHAGODA) Landfill site

1.0		3.0																	
Code	3.1		Glass Bottles				Polythene Bags		Other Plastics	Metal			Animal Feeds		Coconut shells				
	Yes	No	Qty (no/mth)	Price(Rs/kg)	Method	Fre	Qty(kg/mth)	Fre	Qty(kg/mth)	Qty(kg/mth)	Method	Fre	Qty (bag/d)	Fre	Qty (no/d)	Price(Rs/kg)	Method	Fre	
	LSK 39	N																	
LSK 45	N																		
LSK 46	N																		
LSK 57	Y	2							DK				DK		300/d	0.2 Rs ea.		Daily	
LSK 59	Y	1	100	1.50 ea			DK	Daily					2 bag	Daily					
LSK 61	Y	1																	
LSK 62	N																		
LSK 65	N																		
Lsk 66	Y	1											1 bag	Daily					
LSK 67	Y	2											2-3 bag	Daily					
LSK 68	Y	1													0.5bags	0.2 Rs ea.		2 Daily	
LSK 71	Y	1	300			2	Daily			900	5	Daily							
Total			400							>1,000			5-6 bags/d		~325/d	0.2 Rs ea.		Daily	

Notes:

- Coconut shells: 1 bag contains about 180 shells (160-200 half nuts), with each shell weighing 87.5 g (average weight, based on 40 shells)  
 One polysack is 85cm x 55cm x ~40cm (when full) = 0.187 m<sup>3</sup>. Weight of one bag = 15.8 kg - this seems reasonable  
 1x250 ELF lorry - vol estimated to be 1.98 m<sup>3</sup>, from Matale data (3.1 x 1.6 x 0.4m), capable of carrying 25 sacks of coconuts = 393.8 kg/load
- Glass bottles - Weight of 5 beer and 5 arrack bottles = 6.6 kg or 0.66 kg/bottle
- Total no of people interviewed involved in recycling = 9 from 7 households
- Total no of households grazing animals on landfill = 10 households
- Total no of people previously involved in composting = 8 labourers, coordinated by KMC Sanitary Supervisor
- One KMC landfill labourer supplied the following extra information: Al is sold @ 40Rs/kg, bottles for 1Rs ea, scrap metal @5Rs/kg and light bulbs @ 0.25Rs ea (used for making lamps).
- It is difficult to estimate the total quantity of materials recycled from the landfill using the above information as:  
 - interview survey was random sample of households, whereas most households involved in recycling are located close to landfill (~15-20 households according to Survey Assistant), some of which are KMC labourers houses.  
 - KMC labourers are themselves involved in recovering recyclables at the landfill, often getting access to recyclable materials before other scavengers.  
 Instead, the Landfill Manager's extensive experience was relied on, as follows:  
 Coconuts: above survey results give 1.81 bags/d  
 But survey assistants indicated there were more people collecting coconuts than this - ~2-3 households collecting 2 bags/d = 5 bags/d (avg)  
 & Landfill Manager indicated 1 x 250ELF truckload of coconuts per week collected from landfill - estimated no of coconut bags/load = 25 = 3.6 bags/d  
 (Estimated from lorry and sack vol data (see note 1) + practical experience of survey assistant - able to get 11 sacks on bottom layer & approx 14 more on next 2 layers)  
 Use Landfill Managers estimate = 25 bags/wk x 15.8 kg/bag =  
 b. Tin/metal: 2-3 tonnes/2 wks =  
 c. Animal feed: 15 polysacks/d @ 30 kg ea (estimated) =  
 (there are some piggeries located close to landfill, whose pigs don't graze on landfill, which is main reason for this being high)  
 d. Glass bottles: estimated to be 2 times above qty = 800 bottles/mth or 26.7 bottles/d =
- One KMC Sanitary Supervisor started this composting project, using 8 labourers (not known if KMC or other). Composting area was very close to landfill but project was abandoned after 2-3 mths due to lack of support from KMC.

Total =

56	kg/d
179	kg/d
450	kg/d
18	kg/d
702	kg/d

1.0 4.0												
Code	4.1	4.2				4.3	4.4	4.5	4.6		Problems	
	Y/N	Cows	Goats	Pigs	Chicken	Frequency	Health B/NC/W	Compost No:	FD/KI Quantity	Use		
LSK 39	Y		2			Daily	W, Toxic	N				
LSK 45	Y		5			Daily	B	N				
Lsk 46	Y	4				Daily	NC	N				
LSK 57	Y	6	6			Daily	B	N				
LSK 59	N							N				
LSK 61	Y	3	6	15		Daily	NC	N				
LSK 62	N							Y,8	4 Tr/d	Priv	See note 8	
LSK 65	Y	6	9			Daily	NC	N				
Lsk 66	Y		2	5	5	Daily		N				
LSK 67	Y	3		12		Daily	B	N				
LSK 68	Y		2			Irregular	NC	N				
LSK 71	Y		4			Daily	NC	N				
Total		22	29	32	5	Mainly daily	NC-B		4 Tr/d			

1. WASTE STREAM HOUSEHOLD, COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL DATA

a. Residential	Permanent		Floating		Total		Notes
	H/holds	People	H/holds	People	H/holds	People	
KMC Budget 2002	22065	111327		100000		211327	1 H/holds = housing units + collective living quarters
July 2001 census	0	110049					
UDA Development Plan				125000-175000			
Adopted	0	110049	n/a	100000			

Notes:

- July 2001 census results are provisional.
- Estimated 2002 population = 110696 based on 0.59 % average compound population growth rate over period 1981-2001

b. Commercial	No of enterprises						Notes
	Shops	Markets	Hotel	Manuf	Industrial	Total	
Unit	no	stalls	no	no			
KMC Budget 2002						3675	1
Careklean contract 1999						1560	2
Non-ag economic report				227			3
Trade, service, process & prod'n						3410	4
Adopted	2951	469	16	227	12	3675	

Notes:

- KMC budget data = total trade licences, which will include market stalls and hotels
- Careklean contract data relates to city centre only (Zone 1A), based on 1993 conditions, which they assume to be valid given stable condition of town centre
- Source = Non-agricultural Economic Activities Report (Rural Sector only), 1995, Dept of Census & Statistics, Kandy District; covers mining, quarrying and manufacturing - Kandy Four Gravets & Gangawata Korale 95.4 % of KMC population. Hence, above will be a slight under-estimate of the number of mining, quarrying and manufacturing operations in KMC area.
- Source: Analysis of 1994 Trade Licence Records in the Central Province, Joint Inventory; data is for Kandy D.S. only
- Markets data relates to Central, Mennikumbura and Colombo St private markets only - all other markets included under "shops"
- Shops calculated by difference from total less markets less hotels less manufacturing less industrial
- Industrial data from c below.
- Adopted no of "commercial" enterprises = 3170 (shops + manufacturing)

c. Industrial	No of industries				No of workers				Notes
	Garment	Large/med	Other	Total	Garment	Large/med	Small	Total	
KMC MOH	6	18		9	33				
Adopted	4	8			12				

Notes:

- Data from KMC MOH relates to 6 garment factories; 2 quarries, 10 concrete workshops, 6 timber industries (assumed to be large/medium industries); 1 fruit drinks, 1 toffee, 3 batik, 4 arts & crafts (assumed to be small industries)
- Adopted no of industries = those industries who are classified as "industrial waste" in this study.

d. Institutional	No of institutes							
	Govt offices	Schools	Other Ed	Hospital	Religious	Forces	Other	Total
Census 2001								0
Careklean contract 1999								195
JICA Research	70	48	12	8	114	7	0	259
Adopted	70	48	12	8	114	7	0	0

Notes:

- Census no of institutions based on residential places and hence will be an under-estimate - see census definition
- Careklean contract data relates to city centre only (Zone 1A), based on 1993 conditions, which they assume to be valid given stable condition of town centre
- Both census and Careklean contract data believed to include institutions which have been classified here as commercial (i.e. gov't run service enterprises - banks, etc.). Hence JICA total is relatively low as it only includes the categories shown.

General Notes on Shading

- Yellow indicates waste generators surveyed/interviewed during this study.
- Blue or green relate to specific notes described under relevant items.
- Purple shows data used in waste stream calculations
- Orange indicates cells affected by changes in collection tonnages



2. COMMERCIAL & INDUSTRIAL SECTOR - DETAILED INFORMATION

a. General

	No	Avg pers/HH	No of pers	
Care Kleen contract	Households	954	5.0	4770
	Commercial enterprises	1560		
	Institutions	195		
	Total commercial + institutions	1755		
	Roads	10.7 km		
Note 1 Includes 555 "market stalls" not previously included in mkt waste				
Carekleen waste to landfill	78% T/mth from Gohagoda landfill records (May 01-Apr 02 average) =			25752 kg/d
<b>Waste generators in this area already counted</b>				
	No of "shops"	No for WDR	WDR	Units
Households		4770	0.545	kg/cap.d
Markets	Colombo St private	1	30	13.0 kg/stall.d
Hotels	Queens	1	180	
	Casamara	1	50	
Schools	St Sylvester	1	4244	
	Hemamali Balika	1	2553	
	Trinity College	1	3432	
	Vidyartha College	1	2793	
	Badiudin Mahmud Girls College	1	2009	
	Girls High School	1	3636	
other Ed	Technical College	1	583	
Hospitals	General	1	6868	
Religious	Tooth temple	1	105	
	Napha Devalaya	0 NA		NA
	Pathhini Devalaya	1 NA		100 OK
	Kataragama Devalaya	1 NA		210 OK
	Vishnu Devalaya	0 NA		NA
	Sri Selvavinayagar Kovil	1	5	150 OK
Govt	Provincial Education Dept	1	129	95 OK
	All other	30	1024	0.245 kg/worker.d
	KMC	1	500	160 OK
Forces	Kandy police	1	200	100 OK
	Army Singha Regiment	1	300	200 OK
	Bogambara prison	1	2200	388 OK
	Remand prison	1	500	180 OK
	Totals to deduct	51		
	Revised commercial enterprises	1704		revised waste collection =
	Allowing for road sweeping waste =	525 kg/d gives revised total of commercial shop waste only of		16783 WDR = 9.85 kg/shop.d
				16257 WDR = 9.54 kg/shop.d

Notes:

- Many of these institutions are service oriented institutions like banks, etc, which have been classified here under "commercial" - hence, only need to subtract WG data for relevant government offices in this area.
- Household WDR is WGR, assuming all household waste generated is discharged (i.e. no opportunity for open dumping or self-disposal or home composting in this area but neglecting any recycling)
- WGR believed to be too high for Colombo St private market - scale by 0.5
- Average road sweeping waste estimate = 49.1 kg/km.d from three other JICA studies in Poland, Honduras and Dar-es-salaam
- Adopt WGR which includes road sweeping waste, as in most commercial areas, roads will be swept either by shop owners or labourers & included in garbage
- WDR is relatively high but is supported by:
  - small waste generator survey obtained WGR = 3.29 kg/shop.d from 29 small shops that are expected to be relatively small waste producers
  - restaurant/bakery waste collection amounts as estimated by KMC supervisors for 81 restaurants/bakeries throughout the city giving a WDR = 61.7 kg/shop.d & total waste amount of 4996 kg/d (see supporting data)
  - the very high floating population coming into the city each day - 100,000 +
  - observations of the central city area business activities.
- This data is based on the amount of waste actually collected and hence other components of waste stream were estimated, as follows:
  - SWG survey (29 places, central city) & LWG survey (4 places, mainly central city) indicated all use LA/Care Kleen collection service for all their waste except Devon Restaurant has some of its F/K waste collected by Ukuwela piggyery + some comm. places burn a lot of their waste (mainly paper). Based on these results and limited garden area available for most comm. premises (excluding hotels which are treated as separate category), assumed:
    - Self-disposal = 4 %
    - Home composting = 0 %
    - Open dumping = 0 %
    - LA/Care Kleen collection = 94 % or 31.3 T/d (total no of shops x WDR)
    - Generation = 100 % or 33.3 T/d, giving WGR = 10.48 kg/shop.d
    - Recycling = 2 % or 2.0 T/d. This is considered reasonable given that a no of restaurants/reception halls are known to have their food/kitchen waste collected by piggeries, there is a large no of restaurants/canteens in the city (>80) and given the nature of this sector.

**b. Markets**

No	Markets	KMC Budget	No of stalls						Waste disposal	Comments	
			Stall breakdown								
Mainly fresh food and vegetables			JICA	Meat+Fish	Vege+Fruit	Goods	Hotels	Others	Pavement		
1a	Central Market - official	268	277	52	113	104	8	0	0	KMC	data obtained from vet via Market Inspector
1b	Central Market - unofficial		51	5	42	2	0	2	0	KMC	data obtained by field inspection
2a	Menikkumbura Mkt complex (wholesale)	72	71		65	2		3	1	KMC	hotels = 2 canteens, 1 coolspot; others = bank
2b	Menikkumbura Mkt complex (retail)	86	40	8	30	2		0	0	KMC	Retail - actual = 81 but 36 F/V, 1 meat, 4 fish closed
3	Colombo St private market		30	0	28	0		2	0	Care Kleen	counted; 1 closed
	<b>Total</b>	<b>426</b>	<b>469</b>	<b>65</b>	<b>278</b>	<b>110</b>		<b>13</b>	<b>3</b>		
Mainly retail goods											
1	Railway Station Rd (public)	98	119	0	10	39	12	51	7	Care Kleen	data from traders; 2 stalls closed
2	George E de Silva Park (public)	136	138			115	1	22		Care Kleen	1 closed; data from traders/Ekamu Union Sec.; managed by UDA
3	Goodshed Stalls	32	111		21	19	27	32	12	Care Kleen	counted; 3 closed
4	Torrington Lane (public)	33	109	0	0	35	6	66	2	Care Kleen	counted; 75 closed; 2 pavement stalls (details from owners)
5	Keppitipola (public)	36	0							N/a	KMC: 35 of 54 stalls rented; all now closed due to legal dispute
n/a	Other places (public)	50	50							KMC or CK	Assume correct
n/a	Small scattered stalls (private)	58	28							KMC or CK	28 = 58 - 30 (Colombo private mkt stalls (assumed))
	<b>Total</b>	<b>443</b>	<b>553</b>	<b>0</b>	<b>31</b>	<b>208</b>	<b>46</b>	<b>171</b>	<b>21</b>		

**Notes:**

- Market stall data obtained from KMC 2002 budget - budget totals in 2000 = 890, 2001 = 857, 2002 = 869
- Vet said Pola held twice weekly (Tues + Thur) near Bogambara Prison from early morning to ~1pm - ~75-100 pavement stalls - assume waste included in central market SW collection
- George E de Silva market traders employ labourer for collecting waste and cleaning their own environment.
- Markets subdivided as above into mainly meat/fish, vege/fruit stalls and mainly retail - former classified as "markets" with market waste composition given by WACS; latter classified as "commercial enterprises"
- Markets WDR determined from Gohagoda collection records as follows:
  - Menikkumbura market opened in Jan 2002 - use data from this time
  - Total no of market tractor trips in Jan-Apr 2002: 553 trips
  - Total no of days in those 4 mths: 120 days
  - Average no of trips/d: 4.61 trips/d
  - KMC market tractor tonnage/load: 2.47 T/load, using measured volume and WACS mkt waste density (see collection records)
  - Average market waste tonnage: 11.38 T/d
  - Total no of stalls = (Central + Menikkumbura) = 439 + Colombo St market = 30 + Slaughterhouse = 4 gives 473 stalls
  - Average market waste discharge rate: 25.0 kg/stall.d This is high but is based on actual collection data (no of trips); supported by observations, large floating population and 3 of the 5 stationary trailers being located in public open space, in a very densely populated trading area, meaning other people are likely to be using these trailers for disposal of their garbage
  - For waste stream, include additional private market and slaughterhouse - hence mkt waste discharge will be > than above daily average.

**c. Slaughterhouse**

Name	Location	Area (m2)	Avg animals killed per day		Peak animals killed/d		Waste disposal	Comments
			Cows	Goats	Cows	Goats		
Existing KMC Slaughterhouse	Suduhumpola	4050	20-25	15-25	80-100	60-80	To s/w drain to Meda Ela to Mahaweli River	Incl. animal holding area; peak @ Ramadan/other festivals
New KMC Slaughterhouse	Gohagoda	~8100						Not used due to public protests; also relatively far from city

**Notes:**

- Data from KMC Vet Surgeon
- From visit to slaughterhouse, cow section in area is equiv. to ~8-10 stalls; goat section to 6-8 stalls but waste gen. is rel. small - say 2-4 buckets of 50L (15kg ea) = 30-60kg - being conservative, a 4 stalls (around 80kg waste)

d. Hotels

No	Hotel	Address	No of rooms	No of beds	Avg Staff/d	Avg guest/d	SW data			Disposal		WGR (kg/(g+s) disp)	On-site Comp	LA coll'n	Recy	Illegal dump	Direct haul	Total
							Survey	KMC	Use	Main	Other							
H3	Hill Top	200/21 Bahirawakanda, Peradeniya Rd	81	162	NA	1600	140		140	G			20	120			140	
H5	Riverdale	32 Anniwatte Rd	29	62	15	5	50		50	C	2.50		50			50		
H6	Janaki	40/1 Deveni Rajasinghe Mw	72	200	20	10	20	96	58	D	1.93		58			58		
H7	Queens	Dalada Veediya	54	300	130	50	150	14	82	B	0.46		82			82		
H8	King's Park	34 Sangaraja Mw	20	40	35	15	30		30	J/G	0.60		0	30		30		
H9	Suisse	30 Sangaraja Mw	100	190	230	80	50	80	65	G	0.21		25	40		65		
H10	Devon	51 Ampitiya Rd	25	50	30	10	20		20	G	0.50			20		20		
H11	Swiss Residence	23 Bahirawakanda	40	80	50	1800	70		70	G		4	26	40		70		
H12	Casamara	12 Kotugodella Vidiya	35	66	40	10	5	190	97.5	D	1.95		98			98		
H13	Chalet (Helga's Folly)	Frederick E de Silva Mw	36	75	15	8	15		15	C	0.65		15			15		
H14	Citadel	124 Srimath Kuda Ratwatta Mw	121	192	175	80	60	120	90	D	0.35		3	87		90		
H15	LeKandyan Resorts	Heerassagala, Peradeniya	100	200	150	80	275		275	G/H	1.20	10	10	220		35	275	
H16	Topaz & Tourmaline	Anniwatte	75+25	210	150	70	Tr load		280	D	1.27		14	210	56		280	
H17	Mahaweli Reach	35 PBA Weerakoon Mw	117	115	NA	NA	50	80	65	G	N/A	0	0	20	46		65	
H18	Thilanka	3 Sangamitta Mw	80	160	100	80	150	80	115	G/H	0.64		24	28	63		115	
<b>Total</b>			<b>910</b>	<b>2102</b>	<b>1140</b>	<b>3498</b>	<b>1085</b>	<b>940</b>	<b>1453</b>			<b>10</b>	<b>78</b>	<b>698</b>	<b>635</b>	<b>0</b>	<b>35</b>	<b>1453</b>

Notes:

- Hotel names from Sri Lanka Tourism Guide May-Oct 2002 (also in KMC Hotel/g/house/rest file)
- Following hotels were excluded due to being outside city limits:

Hotel	Address	Rooms
Babylon Resort Hotel	Mt Franion Rd, Murutalawa	16
Earl's Regency	Thennekumbura	84
Mansion Nugewefa	213 Aladeniya, Werellagama	10

- Hotel Hantana is now IFS - excluded
- Topaz & Tourmaline under same mgmt - treated together
- Waste disposal codes: A-D = LA/contr collection, E/F = burn/bury, G = recycle, H = compost, I = open dump, J = other
- H8 uses contractor; H16 takes some dry waste direct to Gohagoda
- From Gohagoda records, H15 made 34 trips over 12 mths (May01-Apr 02) @ 1.23m<sup>3</sup>/trip x 303kg/m<sup>3</sup> = 34.8 kg/d
- Blue shaded cells not used for calculating WGR due to data being incomplete or unrealistic
- Green shaded cell indicates collected by piggery at Ukuwella - tot= 369 kg/d while piggery said they collect around 415kg/d of F/K and 29kg/d of plastics, glass, metals from 10 places including these 7 - reasonable agreement
- Total no of hotels = 16 (Topaz and Tourmaline are two separate hotels)
- Total no of guests per day, excluding H3 and H11 = 498 guests/d

Revised total for calc'g WGR	1177.5
Revised staff+guests	1588
WGR =	0.741 kg/(staff+guests).d
Estimated total staff + guests =	1959 using WGR

Assumptions:

- H3: increase stated comp=10 & recy = 100 to balance gen=140
- H8: "garbage taken by private contr'r to Matale" (piggery?)
- H11,H14,H15 - stated compost qtys = kg/d rather than mth
- H11: 40 kg/d recy, balance les compost = LA colln
- H16: 5 % comp 20 % recy
- H17: 70 % recy; bal = LA colln
- H18: 55 % recy

	Galle Wt %	Kandy WAR
F/K	93.4	47.5
Ga/Wd	2.4	12
Pa/Cd	2.8	27
PI	0.4	13.5
GI	0.3	
Me	0.3	
Te	0.2	
In	0.2	7

WAR = weighted average rank

No	Tel
H3	08-224162; 234317; 074-471904
H5	08-223020, 224841
H6	08-224261
H7	08-233026, 222813, 233290
H8	08-225806, 223620, 225807
H9	08-233024-5; 222637, 234960
H10	08-235164-6
H11	074-479055-6
H12	08-224688; 234327; 224474
H13	08-234571
H14	08-234365-6, 226173
H15	08-233521, 233522
H16	08-224150, 233099, 232326-8
H17	074-472727
H18	08-232429; 227160; 074-475200

e. Industries

Industry	Location	Main 3 wastes	Avg no of workers	No	SW Data			Waste disposal		Waste disposal							
					Survey	KMC	Use	Main	Other	OS-disp	Comp	LA colln	Recy	Ill dump	Dir haul	Total	
Ceylon Tobacco Co	62, Mawimada, Kandy	F/K > In > Pa	269	1	Tr load	602	602	J		0.0	0.0	0.0	0.0	0.0	0.0	602.3	602.3
Garment																	
Spectrum Garment	284, Karugastota Rd	Te > F/K > Pa	28			5		5	A	0.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0
Alan Garment	77A, Mapanawathura	F/K > Te	45			5		5	C	5.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Sterling Jersey Company	79, Model House Rd,	Te > F/K > Ga	50			19		19	E	19	0.0	0	0.0	0.0	0	0	19.0
WW Liyanage	24/10 Siyambalag, Rd		NA				80	80	LA colln	0	0.0	80	0.0	0.0	0	0	80.0
Timber processing			123	4		Sum		109	Sum	24.0	0.0	86.0	0.0	0.0	0.0	0.0	109.0
N.D Wijethunga	Kurunegala Rd	SD/WC	Not asked			50		50		33.0	0.0	0.0	17.0	0.0	0.0	0.0	50.0
MH Sugathadasa & Co	47 Kurunegala Rd	SD/WC	Not asked			50		50		50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0
New Mulgampola Timber D	14/34A William Gopal	SD/WC	Not asked			20		20		0.0	0.0	0.0	20.0	0.0	0.0	0.0	20.0
Samantha Timber Depot	86 Katugastota Rd	SD/WC	Not asked			97		97		80.0	0.0	0.0	17.0	0.0	0.0	0.0	97.0
Weerakoody & Co	745 Peradeniya Rd	SD/WC	Not asked			63		63		0.0	0.0	0.0	63.0	0.0	0.0	0.0	63.0
Marle & Sons	101 Katugastota Rd	SD/WC	Not asked			50		50		20.0	0.0	0.0	30.0	0.0	0.0	0.0	50.0
Katugastota Sawmill	Ranawana Rd	SD/WC	Not asked			833		833		400.0	0.0	0.0	433.0	0.0	0.0	0.0	833.0
Other medium/large				7		Sum		1163	Sum	583.0	0.0	0.0	580.0	0.0	0.0	0.0	1163.0
Concrete workshops	No survey			10													
Quarries	No survey			2													
Small																	
Fruit drinks	No survey			1													
Toffee	No survey			1													
Batik	No survey			3													
Arts and Crafts	No survey			4													
Total																	

Notes:

- Codes for waste types: F = food, G = garden, T = textile, P = paper, Pl = plastic, M = metal, Gl = glass, I = inert (dust, dirt, etc.), O = other; SW = sawdust, WC = woodchips
- Code for waste disposal: A-D = LA collection, E/F = burn/bury, G = recycle, H = compost, I = open dump, J = other
- First six timber processing industries are furniture makers, carpentry, timber storage depots, etc. while only the last one is an actual sawmill.
- Concrete workshops and quarries were not investigated as part of this study - most waste is inert + assumed reused or disposed of on site or included under commercial waste.
- Small industries were not investigated as part of this study - assumed their waste included in commercial waste.
- Only four garment factories could be found within the city limits whereas KMC records suggested there are 6
- Ceylon Tobacco Co based on actual Gohagoda trips - 89 over 12 mths @ 2.47 T/load

3. INSTITUTIONS - DETAILED INFORMATION

a. Schools

	Address	Type	Students	Teacher	Total	National School	Board-ers	SW (kg/d)			WGR (kg/(S+S) d)	Notes
								survey	KMC	Use		
1	Dharmaraja College	1AB	4226	166	4392	Yes	Yes					
2	Mahamaya Girls College	1AB	4640	212	4852	Yes	120	150	40	95	0.020	
3	St Anthonys Boys College	1AB	2600	140	2740		300	100	64	82	0.030	Tel: 08 222623 (Principal); semi-govt; compost
4	St Anthonys Girls College	1AB	4042	162	4204				16	32	0.008	Use 2x estimated rate = still low
5	Mawilmada MV	1C	342	36	378				24	24	0.063	
6	Senkadagala MV	1C	967	56	1023							
7	Sri Wimalabuddhi KV	2	209	23	232							No comp, recy, biogas; other name = Dangolla Vidyalaya
8	Nuwara Bowala MV	1C	303	24	327							
9	Gothami BV	1C	1238	49	1287							
10	Dharmaloka KV	2	85	18	103							
11	Dharmashoka KV	2	132	16	148							
12	Senkadagala Vishaka V	1C	168	23	191							
13	Senkadagala Sangamitha V	2	51	13	64							
14	Girls High School	1AB	3466	170	3636	Yes	200	330	195	262.5	0.072	
15	Kingswood College	1AB	3500	170	3670	Yes	60	60	160	110	0.030	
16	Vidyartha College	1AB	2700	93	2793		60	50	40	45	0.016	
17	Pushpadana Girls College	1AB	2276	113	2389	Yes	122	40	45	42.5	0.018	
18	Hememali BMV	1AB	2446	107	2553				109	109	0.043	
19	St Sylvesters College	1AB	4074	170	4244		No	130	110	120	0.028	
20	Mahanama MV	1C	1298	59	1357							
21	Sri Rahula College	1AB	3493	132	3625	Yes			24	24	0.007	
22	Wariyapota Sri Sumangala	1AB	3199	138	3337				160	160	0.048	
23	Swamamali BMV	1AB	3889	139	4028				160	160	0.040	
24	Thakshila KV	2	159	21	180							
25	Dharmawickrama BMV	1C	856	37	893				64	64	0.072	
26	Rasindevi KV	2	296	27	323							
27	Lewla Dodamwala KV	2	69	16	85				24	24	0.282	
28	Sarasevi Uyama MV	1C	2136	89	2225							
29	Keppitipola KV	2	117	23	140							
30	Seethadevi BMV	1C	2036	94	2130				80	80	0.038	
31	Viharamaha Devi BMV	1C	2473	104	2577							
32	Madduma Bandara KV	2	74	14	88		No					Formerly called Bahirawakanda V
33	Badiudin Mahmud Girls College	1AB	1914	95	2009	Yes			100	100	0.050	
34	Siddi Lebbe MV	1C	310	33	343							
35	Zahira MV	1C	677	32	709							
36	Al Hamra KV	2	264	18	282				16	16	0.057	
37	Saulathiya Muslim KV	2	128	19	147				32	16	0.109	Use 50% of KMC rate - still high
38	Kalaimagal MV	1C	619	27	646							
39	Vivekananda Tamil MV	1C	264	17	281							
40	Hindu Senior School	2	378	17	395							
41	Roman Catholic Tamil KV	2	110	10	120							
42	Al Hilala Muslim KV	2	111	11	122							
43	Trinity College	2	3100	332	3432		225	60	200	130	0.038	Private; no census data
44	Good Shepherd Convent		2500	122	2622							Semi-govt; no estimated (shaded blue)
45	Hillwood BMV		1600	130	1730		500	50	50		0.029	P. Jayasingha (08 234 498); priv (semi-govt); comp/biog
46	Visaka Vidyalaya	1AC	193	24	217		No					17 resident staff
47	Mowbray Girls School		315	18	333		254					priv; tamil; incl. asoka children's home (hostel)
48	Ashoka College	2	335	16	351		100					New name = Nelumpokuna MV - now closed
48	Urawalla Vidyalaya		0	0	0							
48	Total		70378	3575	73953				1663	1746	0.033	

Notes:

Associated no of students and staff with WDR estimate = 53167

- Data from 2001 School Census, supplied by Mr Ekanayake, Deputy Director, Administration, District Education Office, Kandy
- Schools are classified as: Type 1AB = years 1-13 (sometimes 6-13) with A level Science/commerce/arts Type 2 = Years 1-11, up to O-level  
Type 1C = years 1-13 (sometimes 6-13) with A level commerce/arts Type 3 = Years 1-5 (sometimes 9) primary
- School population is very large, relative to total Kandy population - Mr Ekanayake said that many students come to school in Kandy from outside the city - possibly as much as 75% in some cases.
- DKNK Dassanayake, Divisional Environmental Organiser, Kadugannawa (does composting in villages)
- Shaded (yellow) schools were surveyed, with survey data being used rather than census - figures were changed in all cases
- Malani Abewikkrama, CEA Env commissioner (08 225838 hm) teaches at No2 school

**JICA survey results**

	Main	Other	Assumptions	St + stud	OS-disp	Comp	LA colln	Recy	Ill dump	Total
Hillwood College	G - F/k to pigs; other	H - Ga	In = SD; other recy	1730	4.5	7.5	0.0	38.0	0.0	50.0
St Anthony's Boys College	C	H - Ga		2740	0.0	12.3	69.7	0.0	0.0	82.0
Trinity College	C			3432	0.0	0.0	130.0	0.0	0.0	130.0
Vidyartha College	C			2793	0.0	0.0	45.0	0.0	0.0	45.0
Pushpadana Girls College	C	H	comp = ga only	2389	0.0	6.4	36.1	0.0	0.0	42.5
Girls High School	C	H	comp = ga	3636	0.0	39.4	223.1	0.0	0.0	262.5
St Sylvester's College	C			4244	0.0	0.0	120.0	0.0	0.0	120.0
Kingswood College	C			3670	0.0	0.0	110.0	0.0	0.0	110.0
Mahamaya Girls College	E	F		4852	95.0	0.0	0.0	0.0	0.0	95.0
				<b>Total</b>	<b>99.5</b>	<b>65.6</b>	<b>734.0</b>	<b>38.0</b>	<b>0.0</b>	<b>937.0</b>
			Disposal method %		10.8	7.0	76.3	4.1	0.0	100.0

**Notes:**

- Codes: C = LA/contr'r colln; E/F = burn/bury, G = recy, H = comp, J = other (own site for Girls High School)
- Total staff + students surveyed = 40 % of all schools - hence results are considered to be reasonably representative
- Survey data represents waste generation (i.e. total)
- Waste stream calculated using survey information and school waste composition data

**School + other educational institutes - waste comp'n**

	Galle wt %	Kandy WAR	Adj-usted
Fd/ki	34.2	24	34.2
Ga/wd	3	15.5	15
pa/cd	26.6	27	26.6
glass	0	0	0
plastic	13.7	8	13.7
metals	0	0	0
textile	1.5	0	1.5
inerts	20.9	6.5	8.9
<b>Total</b>	<b>99.9</b>	<b>99.9</b>	<b>99.9</b>

**Notes:**

- Galle data from ERM study
- From comp'n of ranks, increase gard/wood & decrease inerts by 12 %

**b. Other Educational Institutes**

No	Name	Address	Students	Staff	Total	Boarders	SW (kg/d)			WGR (kg/(S+S))	Notes
							survey	KMC	Use		
1	Technical Institute (behind Education Office)	Near Railway Station	550	33	583			92	92	0.158	15 teachers + 18 other
2	Technical College Kandy	Arruppola watta Rd	1400	150	1550		40		40	0.026	
3	Nurses Training School	Hantane Rd	1000	43	1043	100					2
4	Deaf & Blind School	Sirinath Kudu Ratwatte	154	28	182		7.9	40	24	0.132	
5	Peradeniya University		11000	2500	13500	16 hostels	3000			0.222	1 runs 3-5d courses
6	Regional Telecomm. Training Centre	Peradeniya University	15	9	24						
7	Colombo International School	Outugemunu Rd	300	80	380	None	30		30	0.079	
8	Al-Amran International College - Girls		346	28	374			96	96		22 teachers + 6 other, KMC data = both boys/girls
9	Al-Amran International College - Boys		800	54	854						42 teachers + 12 other
10	Gateway International School	George E De Silva Mw	565	70	635						
11	Vision International College		500	32	532				80	0.150	28 teachers + 4 other
12	Administration Training Centre	Madawela Rd, Katugastota			197			16			Estimated staff+students based on avg WDR
	<b>12 Total</b>		<b>16630</b>	<b>3027</b>	<b>19657</b>				<b>362</b>	<b>0.081</b>	Excluding Peradeniya University as special case
											No of students+staff associated with WDR estimate = 4455

**Notes:**

- Peradeniya University has a daytime population of about 13,500 including 11,000 students; approx 40% of students don't live on campus; nos include dental and medical facilities  
The university composts an estimated 625 kg/mth of garden waste to produce 2-3m3 of compost/mth - hence total waste generation = 3021 kg/d or 0.224 kg/(staff+student).d
- Data from Kandy General Hospital Administration Officer
- Police Training school (formerly in Asgiriya Circular Rd) has been shifted to Kundesale
- Use WGR for all institutes except Peradeniya University - treated as special case - hence total students and teachers = 6197

**JICA survey + KMC data**

	Main	Other	Assumptio	St+st	OS-disp	Comp	LA colln	Recy	Ill dump	Total
JICA	Colombo Int'l School			380	0.0	0.0	30.0	0.0	0.0	30.0
	Technical College Kandy	H - Ga		1550	34.0	6.0	0.0	0.0	0.0	40.0
	Deaf and Blind School	F	67:33 split	182	7.9	0.0	16.1	0.0	0.0	24.0
KMC	Technical Institute			583	0	0	92	0.0	0.0	92
	Vision International College			532	0	0.0	80	0.0	0.0	80
	<b>Total</b>			<b>3227.0</b>	<b>41.9</b>	<b>6.0</b>	<b>218.1</b>	<b>0.0</b>	<b>0.0</b>	<b>266.0</b>
			Disposal method %		15.8	2.3	82.0	0.0	0.0	100.0

**Notes:**

- Codes: C = LA/contr'r colln; E/F = burn/bury, G = recy, H = comp, J = other
- Total staff + students surveyed = 52 % of all places (excl Peradeniya Univ) - results are considered reasonably representative
- Survey data assumed to represent waste generation (i.e. total)
- In this case, KMC data included as well, as Technical College self-disposal amount is believed to distort total if only three institutes covered

c. Hospitals

Hospitals	Location	Type	No of beds	Bed Occup. (%)	Avg no per day		Staff	Patients + Staff	SW (kg/d)			WDR (kg/(P+S).d	Notes
					Out-patients	Clinical patients			survey	KMC	Use		
Kandy General Hosp	Bogambara area	govt	2003	93	879	1426	2700	6868	8840	2700	2700	0.393	Tel: 08 222261, 08 222170
Peradeniya Teaching Hosp	Peradeniya Rd	govt	830	80	782	580	1400	3426	3480	1200	1200	0.350	Tel: 08-388001
Dental Hospital	Peradeniya Rd	govt	36	100	150	60	130	376	75	320	198	0.525	Note 2
Katugastota district Hosp	Madawala Rd	govt	45	96	450	450	48	991	132		132	0.133	
Kandy Nursing Home	25 Anagarika Dharmapala Mw	private	24	100	55	0	80	159	50	48	49	0.308	Tel: 08 234282
Lakeside Adventist Hosp	40 Sangaraja Mw	private	35	80	150	0	82	260	500	48	96	0.389	Tel: 08 223466
Kandy Private Hosp	255/8 Katugastota Rd	private	35	100	25	0	100	160	135	32	83	0.522	Tel: 08 224326
Suwasevana Hosp	Peradeniya Rd	private	100	90	75	0	250	415	152	400	276	0.665	Tel: 08 234016
<b>Total</b>			<b>3108</b>		<b>2566</b>	<b>2516</b>	<b>4790</b>	<b>12665</b>			<b>4734</b>	<b>0.374</b>	

Notes:

1. Abeysekera Maternity Hospital has closed and is now an international school
2. Dental Hospital is attached to Peradeniya Hospital but is administered by the university
3. New private Aloka hospital is under construction - 4 x 20,000 Ft2 = 80000 Ft2 (7430m2 floor space), 150 beds; includes own WWTP. Approved by UDA but KMC is disputing.
4. For converting hospital survey waste data into kg:

Hospital	Loads/d	Units	Conv'n factor
Kandy General		4 tr load	2218 kg/load
Peradeniya Teaching		1.5 Comp'r load	2320 kg/load
Katugastota District		5 bins	26 kg/bin
Kandy private		2 bins	67 kg/bin
Suwasevana	0.25	Lorry load	607 kg (assume small = 2m3 cap, vol from Matale data)

Adopted waste discharge figures based on:

1. KMC records considered accurate for Kandy General and Peradeniya teaching hospitals - the survey data is way too high.
2. Assume average for Dental, KNH, KPH and Suwasevana
3. Lakeside survey estimate considered too high - use 2x KMC estimate
4. Use survey data for KDH
5. Compare overall WDR with that for Galle of 0.28kg/(patients+staff).d - OK

- a. KPH bin = 2.5ft high, dia = 2.0ft; vol = 0.222 m3
- b. Katugastota bin = 2.5ft high, top dia = 1.5, bottom dia = 1.0; vol = 0.087 m3
- c. Assume hospital waste density = 303.4 kg/m3 (WACS survey, Kandy)

JICA survey + KMC data

	Main + Other	Haz	Notes/assumptions	OS-disp	Comp	LA colln	Recy	lll dump	Total
Kandy General Hospital	A + F, G (30kg/d F/K)	A,F	F/K to pigs	24.5	0	2700	44	0	2769
Peradeniya Teaching Hosp	A+G (30kg/d F/K+oth), J (ga)	E,F	F/K to pigs; 20kg/d ga waste	67	0	1200	22	20	1309
Dental Hospital	A	I		1.7	0	198	0	0	199
Katugastota District Hospita	C	F		Negl	0	132	0	0	132
Kandy Nursing Homes Ltd.	A	A,F		0	0	49	0	0	49
Lakeside Adventist Hospital	C + F	E,F		0	0	96	0	0	96
Kandy Private Hospital	B	E,F		Negl	0	83	0	0	83
Suwasevana Hospital	A	F,I,L		2	0	276	0	0	278
			Total	95	0	4734	67	20	4915
			Disposal method %	1.9	0.0	96.3	1.4	0.4	100.0

Notes:

1. Codes: A-D = LA/contr'r colln; E/F = burn/bury, G = recy, H = comp, I = incinerate J = open dump, K = other
2. JICA survey and KMC data assumed to represent normal waste generation (i.e. excluding healthcare hazardous wastes); HH waste included in waste stream table above
3. Hazardous healthcare waste: blue = burn/bury; green = incinerate
4. Peradeniya hospital recycling based on 67,750 pl/gl/me containers, 605kg tins, 91kg cardb'd with each container assumed to be 50g = 4084 kg per 6/mths = 22.4 kg/d
5. Kandy general recycling obtained pro rata from Peradeniya data, scaling up by total no of patients+st 2.0 x 22.4 = 44.2 kg/d
6. Hospital waste generation rate = 0.388 kg/(patients+staff).d

d. Central government, provincial council and MC summary data

Central Government - Offices within KMA	Staff	SWM Data (kg/d)			Disposal		kg/worker.d						Total	
		Survey	KMC	Use	Main	Other	WGR	OS-disp	Comp	LA colln	Recy	Ill dump		
1 District Secretariat	53													
2 District Forest Office	36	10		10	F		0.278	10	0	0	0	0	0	10
3 Survey Office	39													
4 Commissioner of Buddhist Affairs	10													
5 Dept of National Archives	9													
6 Archaeology Dept	119													
7 Museums Dept	19													
8 Audit Superintendent's Office	9													
9 Inland Revenue Office	56													
10 Dept of Elections	25													
11 Ass: Labour Commissioner's Office - North	33													
12 Ass: Labour Commissioner's Office - South	34													
13 Land Registrar's Office	57													
14 Planning Secretariat	16													
15 Dept of Statistics	30													
16 Divisional Secretary- Kandy	95													
17 Valuation Dept	50													
18 Dept of Registration of Persons	3													
19 Dept of Motor Traffic	9													
20 Samurahi Commissioners Dept	5													
21 Dept of Internal Trade	13													
22 Dept of Information	2													
23 Dept of Poor Relief	4													
24 Assistant Commissioner of Explosives	1													
25 Measurement Units, Standards and Survey Dept	7													
26 Progress Monitoring Unit, Dept of Agriculture	750	Tr		630	C	F/G	0.840			567	63		630	10 %
27 Urban Development Authority	52	15		15	F		0.288	15					15	assumed to be recycled
<b>Total</b>	<b>1536</b>													
<b>Provincial Council - Ministries</b>														
Cadre														
1 Governor's Office	16													
2 Governor's Personal cadre	5													
3 Governor's Residence	7													
4 Pro Public Service Commission	16													
5 Head Quarter Secretariat	167		85				0.000							
6 Provincial Revenue Dept	26													
7 Provincial Engineering & Construction Unit	114													
8 Chief Minister's Office	38													
9 Chief Minister's personal cadre	6													
10 Chief Minister's residence	9													
11 Video unit	5													
12 Provincial Dept of Education	129	1 Tr/3d	95	95	A		0.736			95			95	
13 Provincial Dept of Land	21													
14 Provincial Dept of Local Government	40													
15 Library Service Board	1													
16 Provincial Dept of Cultural Affairs	12													
17 Provincial Ministry of Agriculture	53													
18 Personal cadre of Minister of Agriculture	5													
19 Provincial Dept of Agriculture	43													
20 Dept of Youth Services	14													
21 Co-operative Employees Commission	6													
22 Co-operative Development	60													
23 Provincial Dept of Rural Development	28													
24 Ministry of Industries	71													
25 Personal Cadre of Minister of Industries	5													
26 Provincial Dept of Textiles	51													
27 Provincial Dept of Small Industries	53													
28 Provincial Dept of Animal Husbandry	64													
29 Provincial Dept of Social Services	14													



Central Government - Offices within KMA		Staff	Survey	KMC	Use	Main	Other	WGR	OS-disp	Comp	LA colln	Recy	Ill dump	Total
30	Ministry of Transport	43												
31	Personal cadre of Minister of Transport	5												
32	Provincial Dept of Motor Vehicles	15												
33	Provincial Dept of Housing	23												
34	Provincial Dept of Women's Affairs	12												
35	Ministry of Health	42												
36	Personal cadre of Minister of Health	5												
37	Provincial Dept of Health	247												
38	Provincial Dept of Ayurvedha	13												
39	Provincial Dept of Sports	21												
40	Provincial Dept of Probation and Child Care	36												
41	Divisional Secretariat - Gangawata Korale	145												
<b>Authorities</b>														
42	Passenger Transport Development Authority	120												
<b>Total</b>		1806												
<b>KMC</b>	Kande St	500	160		160	C		0.320			160			160
<b>Total</b>			185	180	910				25	0	822	63	0	910
Totals for calculating WGR		1634			910			0.557	25	0	822	63	0	910
Totals excl Education and Agriculture depts		755			185			0.245	25	0	160	0	0	185
									13.5	0.0	86.5	0.0	0.0	100.0
									13.0		82.0	5.0	0.0	100

## Other Govt

Institute of Fundamental Studies	Hanthana Rd	NA	10		10	D		NA						
Postal Complex	Nr Railway station	475	200	95	150	F		0.316						
Telecom	Galaha Jn, Kandy			120										
Petroleum Corporation	Old Galaha Rd, Kandy			120										
Water Board	Peradeniya Rd, Kandy			96										
Post Office	Madawela Rd, Katugastota			32										
Railway station	Madawela Rd, Katugastota			18										
Zonal Education Office	Matale Rd, Katugastota			24										
Lanka Electricity Board	Matale Rd, Katugastota			16										
Institute of Central Administration	Kandy			24										
Telecom	Kandy			110										
<b>Notes:</b>		<b>Total</b>	210	655	160									

Use these %, taking into account some recycling + self-disposal believed to be reasonably significant for government offices

- Government is broken down into 3 separate categories: Central government offices, provincial council workers and MC.
- In addition, some other government run enterprises are included under "other" - however, these are mainly service oriented institutions and have been included with the commercial sector
- Central government and Provincial Council cadre details obtained via Mr Herath, Senior Statistician, District Office of Census & Statistics (existing cadre, up to May 2002)
- KMC data obtained from survey interview for KMC building in Kande St but actual total = 2130 (budget data includes 2023 permanent + 107 security guards)
- Kandy district has a total of 57,963 govt employees in 1998, covering 20,979 state employees, 22,089 provincial public sector employees and 14,895 semi-government employees
- Progress Monitoring Unit, Dept of Agriculture located within Peradeniya Univ campus - waste generation based on 2.1m3 tractor
- IFS is government research centre
- In Galle, a WGR of 0.17kg/worker.d was obtained - hence use lower value calculated here excluding Education and Agriculture departments + corresponding %
- Total no of government workers = 5472 including all KMC workers
- Green shaded cells = govt institutes believed to be located in Careklean garbage collection area

## e. Religious Institutes

Religious Institutes	No	Resident clergy	Notes
Buddhist	70	608	See note 1
Hindu	14	31	Largest hindu kovil h 5 residents; assume others have 2 residents each
Muslim	17	34	Assume 2 residents per mosque
Christian	13	48	Assume 2 resident clergy per 24 nuns at convent
<b>Total</b>	114	721	

## Notes:

- No of residents monks estimated based on statistical and JICA interview survey data - see separate sheet. This includes two very large institutions - Tooth Temple (105 resident monks) and Malwatta M V (80 resident monk)
- Buddhist institutes listed on separate page (i.e. not in this database)
- Table below does not include all institutes - just those shown on Kandy city map
- Sources: District Office of Dept of Census and Statistics; Buddhist, Hindu and Muslim Cultural Ministries
- Total workers to which WGR applies (excluding Tooth Temple) = 616

Religious Institutes - details

No	Religious Institutes	Location	No of res clergy	No of visitors		Peak season	SW (kg/d)		
				Avg	Peak		survey	KMC	Use
<b>Buddhist</b>									
1	Sri Dalada Maligawa (Temple of Tooth Relic)	Dalada St	109	20000	100000	Poya day	1 Tr	450	450
2	Malwatta Vihara (Monastery)		80	1000	2000	Poya day	250		250
3	Asgiriya Vihara (Monastery)		14	12	25	Poya day	50		50
4	Kataragama Dewala	Kotugodella St						210	
5	Temple	western boundary of city							
6	Tapovana Temple	Kande St							
7	Watagoda Temple	Dharmasoka Mw							
8	Pathma Retreat Centre	Outugemunu Mw							
9	Saddharmabhasa Pirivena (Buddhist seminary)	Dhammadassi Mw							
10	Wijayasundarama Vidyaraya	Wariyapola Mw							
11	Sri Suddrama Purana Viharaya	Sirimavo Bandaranayake Mw							
12	Sri Wajeraramaya	Vajirarama Mw							
13	Sri Pusparama Viharaya	Sirimavo Bandaranayake Mw							
14	Sri Bodhukkaramaya	Bodhi Rukkaramaya Mw							
15	Sri Dalada Tapowanaramaya	Wewelpitiya Rd							
16	Sri Subaddharama Viharaya	Sirimath Kuda Mw							
17	Sri Wardanarama Viharaya	Medankara Mw							
18	Gangarama Viharaya	Medankara Mw							
19	Embli Viharaya	Bomalawa Rd							
20	Nittawela Viharaya	Nittawela Rd							
21	Sri Sangamittaramaya	Off Outugemunu Mw							
22	Sri Anandabodhi Viharaya	Off Outugemunu Mw							
23	Sri Sangabodi Vinaraya	Siyambalagastenna Rd							
24	Sri Rajasingharamaya	off Galagedara Rd, Katugastota							
25	Sri Ranarajaramaya	off Galagedara Rd, Katugastota							
26	Natha Dewala Temple + kovil + monks	Kandy						NA	
27	Paththini Devalaya Temple + kovil + monks	Kandy							100
28	Vishnu Devalaya Temple + kovil + monks	Kandy						NA	
<b>Hindu</b>									
1	Pillayar Kovil	Bandaranayake Mw						129	
2	Sri Selvenagar Kovil	Peradeniya Rd	5	150	300	Hindu fe	150		150
3	** Kovil	nr Botanical Gardens							
4	Hindu Cultural Centre	Peradeniya Rd				Many weddings		400	
<b>Christian</b>									
1	Carmelite Convent	Nr Mahaweli Reach	24				20	40	30
2	** Church	Siyambalagastenna Rd							
3	** Church	Sri Sumangala Mw							
4	Weslayan Church	Yatinuwara St							
5	Christ Church	Yatinuwara St							
6	Baptist Church	Dalada Veddiya							
7	St Anthony's Church	Kotugodella St							
8	St Paul's Church	Deva Veediya							
9	** Church	off Halloluwa Rd							
10	St Joseph's Church	Sirimath Kuda Mw							
11	St Marys Church	Sirimavo Bandaranayake Mw							
12	St Josephs Church	Sirimavo Bandaranayake Mw							
13	St Theresa's Church	A5							
<b>Mosques</b>									
1	** mosque	Dharmasoka Mw							
2	** mosque	Raja Veediya							
3	Meara Makkam mosque	Sumangala Mw							
4	** mosque	Bandaranayake Mw							
5	** mosque	George RE de Silva Mw							
<b>Total</b>									

Notes:

1. Religious Institute names taken from map of Kandy City supplied by District Survey Office
2. Malwatta & Asgiriya Monasteries are the 2 most important SL buddhist monasteries & are located on opposite sides of Kandy Lake.
3. \*\* indicates name not shown on map
4. Interviews conducted with shaded institutes (yellow)
5. Good Shepherd convent details not included as assumed covered by school (Kandy convent)

JICA survey + KMC data

	Main	Oth	Notes/assumptions	Resid	SWM Data (kg/d)			WGR	OS-disp	Comp	LA colln	Recy	Ill dump	Total
					Survey	KMC	Use							
Matwathu Maha Vihara	C			80	250		250	3.13	0	0	250	0	0	250
Asgiriya Maha Vihara	E	F		14	50		50	3.57	50	0	0	0	0	50
Sri Selvenagar Kovil	C			5	150		150	30.00	0.0	0	150	0	0	150
Temple of Sacred Tooth Re	D			105	1 Tr	450	450	4.29	0	0	450	0	0	450
St Joseph Carmel Convent	G/H	B/E/F	Main=30% ea, oth =20% ea	24	20	40	30	1.25	6	9	6	9	0	30
<b>Total</b>				<b>228.0</b>	<b>470</b>	<b>490</b>	<b>930</b>	<b>4.08</b>	<b>56</b>	<b>9</b>	<b>856</b>	<b>9</b>	<b>0</b>	<b>930</b>
Disposal method %									6	1	92	1	0	100
Excl kovil data				223	Revised WGR		780	3.50	56	9	706	9	0	780
Disposal method %									7	1	91	1	0	100
Excl tooth temple data				118	Revised WGR2		330	2.80	56	9	256	9	0	330
Disposal method %									17.0	2.7	77.6	2.7	0.0	100

kg/(resid.d)

Notes:

- Codes: A-D = LA/contr/r colln; E/F = burn/bury, G = recy, H = comp, I = incinerate J = open dump, K = other
- WGR1 revised to exclude kovil SW data (data possibly relates to festival days); WGR2 also excludes Tooth temple - treat separately as special case.
- Adopt WGR2 for estimating religious institutes WG & use disposal method %s associated with this WGR - considered reasonable

f. Security Forces - details

	Resid staff	day staff	Inmates	SW Data			WGR	Disposal		OS-disp	Comp	LA colln	Recy	Ill dump	Total
				Survey	KMC	Use		Main	Other						
<b>1. Army</b>															0
a. Army Camp (2nd Singha Regiment)		300	0		200		200	0.667	A			200			200
b. Army Training College		200			50		50	0.250	E	F	50				50
<b>2. Prison</b>															
a. Bogambara Prison			325	2200	375	400	387.5	0.176	C			387.5			387.5
b. Remand Prison			100	500	180		180	0.360	A			180			180
<b>3. Police</b>															
a. Peradeniya Rd		30					7.5	0.250	A			7.5			7.5
b. Kandy		200			100		250	0.500	A			100			100
c. Katugastota		50			48		24	0.480	A			24			24
<b>Total</b>		<b>500</b>	<b>705</b>	<b>2700</b>	<b>905</b>	<b>698</b>	<b>949</b>	<b>0.243</b>			50	0	899	0	949
Notes:															
Total				3805							5.3	0.0	94.7	0.0	100

- Army training college include army signals school
- Police staff at A and C estimated by Kandy police station staff
- Consider KMC's estimates of police waste generation too high - use survey value for Kandy police and 50% of Katugastota KMC value & assume a value for Peradeniya Rd based on avg WGR
- WGR units = kg/(resid + staff).d, includes inmates at prison

WASTE STREAM ESTIMATION

Waste Source	Waste Generation Rate (WGR)		No	Gen'n (T/d)	Sub-total		On-site Disp	On-site comp	Discharge for coll'n	Recycle	Illegal dumping	Direct haul	Total (check)	Notes
	WGR	Units			(T/d)	(%)								
Households	0.545	kg/cap.d	110696	60.31	60.31	46.1	19.58	4.02	27.40	2.52	6.78	0.00	60.31	1
Commercial	10.48	kg/shop.d	3178	33.30	33.30	25.4	1.33	0.00	31.30	0.67	0.00	0.00	33.30	2
Hotels	0.741	kg/(guests+staff).d	1959	1.45	1.45	1.1	0.01	0.08	0.70	0.63	0.00	0.03	1.45	3
Markets	25.9	kg/stall.d	473	12.26	12.26	9.4	0.00	0.00	12.25	0.02	0.00	0.00	12.26	4
Institutions														
a. Schools	0.033	kg/(students+staff).d	73953	2.43			0.26	0.17	1.90	0.10	0.00	0.00	2.43	5
b. Other Educ Inst.	0.081	kg/(students+staff).d	6157	0.50			0.08	0.01	0.41	0.00	0.00	0.00	0.50	6
c. Peradeniya University	0.224	kg/(students+staff).d	13500	3.02			3.00	0.02	0.00	0.00	0.00	0.00	3.02	7
c. Hospitals	0.388	kg/(patients+staff).d	12655	4.92			0.10	0.00	4.73	0.07	0.02	0.00	4.92	8
d. Govt offices	0.245	kg/worker.d	5472	1.34			0.17	0.00	1.10	0.07	0.00	0.00	1.34	9
e1. Tooth Temple	4.29	kg/clergy.d	105	0.45			0.00	0.00	0.45	0.00	0.00	0.00	0.45	10
e2. Other Religious	2.80	kg/clergy.d	616	1.72			0.29	0.05	1.34	0.05	0.00	0.00	1.72	10
f. Security Forces	0.243	kg/(resid+staff).d	3905	0.95	15.33	11.7	0.05	0.00	0.90	0.00	0.00	0.00	0.95	11
Industries														
a. Ceylon Tobacco Co	3.01	kg/worker.d	200	0.60			0.00	0.00	0.00	0.00	0.00	0.60	0.60	12
b. Garment Factories	Data incomplete	kg/worker.d		0.11			0.02	0.00	0.09	0.00	0.00	0.00	0.11	13
c. Timber processing	Data incomplete	kg/worker.d		1.16	1.87	1.4	0.58	0.00	0.00	0.58	0.00	0.00	1.16	14
Other														
a. IDP	3.50	T/d		3.50	3.50	2.7	0.00	0.00	3.50	0.00	0.00	0.00	3.50	15
b. Botanical Gardens	2.93	T/d		2.93	2.93	2.2	0.33	2.60	0.00	0.00	0.00	0.00	2.93	16
<b>Total</b>	<b>1.18</b>	<b>kg/cap.d</b>	<b>110696</b>	<b>130.95</b>	<b>130.95</b>	<b>100.0</b>	<b>25.80</b>	<b>6.95</b>	<b>86.07</b>	<b>4.70</b>	<b>6.80</b>	<b>0.64</b>	<b>130.95</b>	
Recycling from discharge									0.00	0.00				19a
Recycling from collection									-0.11	0.11				19b
Adjusted totals							25.80	6.95	85.96	4.81	6.80	0.64	130.95	
<b>Disposal to landfill from within KMC (from landfill records)</b>									<b>74.80</b>		<b>17.96</b>	<b>0.64</b>		<b>20</b>
<b>Direct haulage to Gohagoda from outside KMC</b>														
a. Harrispatuwa PS	2.59	T/d		2.59	2.59		0.00	0.00	0.00	0.00	0.00	2.59	2.59	21
b. Bata Shoe Co.	0.08	T/d		0.08	0.08		0.00	0.00	0.00	0.00	0.00	0.08	0.08	21
<b>Total disposal to Gohagoda landfill</b>									<b>74.80</b>			<b>3.31</b>		
Recycling from final disposal									-0.70	0.70				19c
Recycling from illegal dumps									0.16	-0.16				19d
<b>Revised total</b>				<b>133.63</b>	<b>133.63</b>		<b>25.80</b>	<b>6.95</b>	<b>74.10</b>	<b>5.67</b>	<b>17.79</b>	<b>3.31</b>	<b>133.63</b>	

Notes:

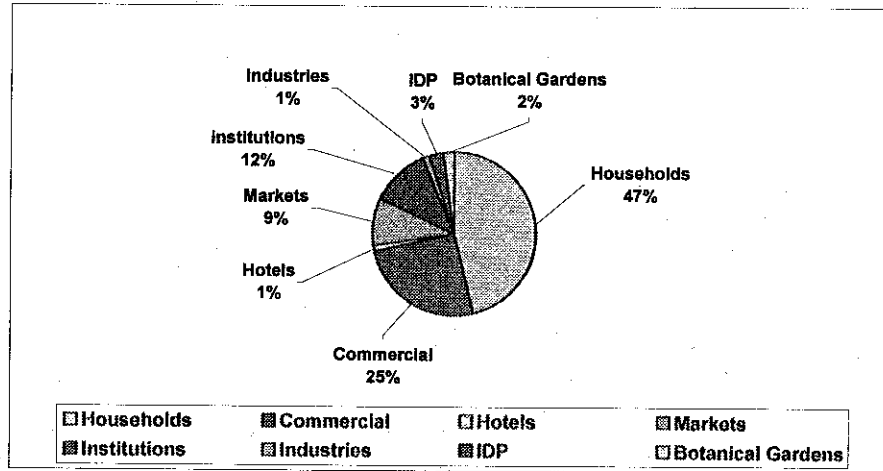
- Household WGR was determined using Kandy WACS data while disposal methods were determined using household survey data, which gave the following % of households using different methods:
- Commercial waste discharged for collection determined from Care Klean data for central city area, taking into account minor recycling and scaled to obtain data for whole city.
- Hotel waste stream data calculated from interview survey results and KMC data, supplemented by piggery interview survey - recycling is high due to most food/kitchen waste going to Ukuwela piggery.
- Markets: v. small amount of recycling occurs in markets, with MM obtaining 1-4% of their paper/cardboard, glass, metals and batteries from markets - using MM survey data, market recycling calculated = 17.4 kg/d
- School's waste stream data calculated from interview survey results - see calculations under school staff and students data - assumed recycling figure includes recycling going to middlemen
- Other educational institutes waste stream data calculated from interview survey results and KMC collection data - see calculations under institute data
- Peradeniya university specified separately, with estimated waste generation and composting based on interview survey with University PHI in charge of SWM
- Hospital waste stream data calculated from interview survey results - see calculations under hospital data; assumed recycling figure includes recycling going to middlemen
- Govt offices calculated based on no of workers and estimated WGR (obtained using limited data).
- For religious institutes, Tooth temple treated separately, due to large amt of waste generated by high no of visitors; while all other places combined into single category.
- Security Forces covers Army, Police and prison in Kandy - for breakdown of each, see detailed data
- Ceylon Tobacco Co takes its garbage by its own tractor directly to Gohagoda - tonnage based on Gohagoda records over 12mths.
- Garment factory waste tonnages estimated from survey interview data
- Timber processing sawdust/woodchips waste estimated from survey interview data - sawdust is either burnt on site or given away (e.g. mushroom farmers), while woodchips are given away or sold.
- IDP waste tonnage estimated from trips data over a 12 mth period; IDP waste is transported directly to Gohagoda by KMC tractor
- Botanical Gardens survey data: 26m<sup>3</sup>/d of grass/leaves normally collected for composting/day = 2.6 T/d, using gdn waste density of 100 kg/m<sup>3</sup> (Tchobanoglous et al) & 1/2 small tr (normal waste) = 0.33 T/d
- Assumed conservancy waste already covered by market and hospital waste
- "Other" private loads primarily covered recorded at landfill primarily covered already (CTC, LeKandyan) - assume any others already included in commercial waste
- 19a. Recycling at discharge: 0.00 T/d, assumed negligible due to large amount of at source recycling (individual collectors/direct to shops) + very few scavengers seen collecting recyclables after discharge
- 19b. Recycling during collection: 0.11 T/d
- 19c. Recycling at landfill: 0.70 T/d, from Landfill Manager's estimate and landfill survey results
- 19d. Recycling from illegal dumps: 0.16 T/d, pro rata from illegal dumping amt/total waste disposal to Gohagoda
- Illegal dumping amount adjusted to account for difference between estimated collection+direct haul amount and measured Gohagoda disposal amounts
- These loads come from outside the KMA area.

4-18

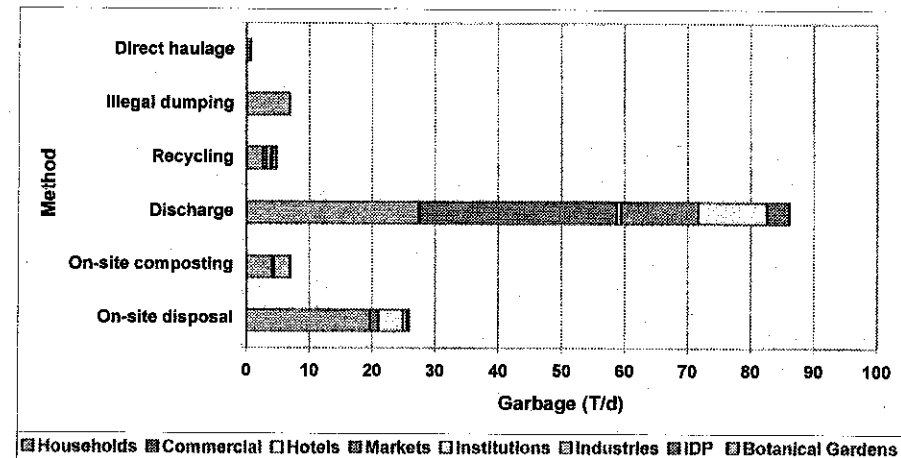
Method OS-disp Comp Disch Recy Ill dump Dir haul Total  
% 32.5 6.7 45.4 4.2 11.2 0.0 100.0  
Details on separate sheet

**Graphical Data**

Waste Source	Generation (T/d)	%
Households	60.31	46.05
Commercial	33.30	25.43
Hotels	1.45	1.11
Markets	12.26	9.37
Institutions	15.33	11.70
Industries	1.87	1.43
IDP	3.50	2.67
Botanical Gardens	2.93	2.24
<b>Total</b>	<b>130.95</b>	<b>100.00</b>



Waste Source	On-site disposal	On-site composting	Discharge	Recycling	Illegal du	Direct haulage
Households	19.58	4.02	27.40	2.52	6.78	0.00
Commercial	1.33	0.00	31.30	0.67	0.00	0.00
Hotels	0.01	0.08	0.70	0.63	0.00	0.03
Markets	0.00	0.00	12.25	0.02	0.00	0.00
Institutions	3.95	0.25	10.83	0.28	0.02	0.00
Industries	0.61	0.00	0.09	0.58	0.00	0.60
IDP	0.00	0.00	3.50	0.00	0.00	0.00
Botanical Gardens	0.33	2.60	0.00	0.00	0.00	0.00
<b>Total</b>	<b>25.80</b>	<b>6.95</b>	<b>86.07</b>	<b>4.70</b>	<b>6.80</b>	<b>0.64</b>



5. SUPPORTING DATA

a. Restaurants & Bakeries

No	Restaurant/bakery	Address	No of staff	Cust/d Avg - max	Waste disposal (kg/d)		Comments	Tel
					Survey	KMC Use		
1	Awanhala Hotel	Dalada Veediya					2	
2	Bake House Hotel	36 Dalada Veediya				160	160	1, 3, 5
3	Chi Cheong Chinese Restaurant	189 Peradeniya Rd						3
4	Chuty Restaurant	Peradeniya St				205	205	2
5	Devon Hotel	11 Dalada Veediya	180	500 - 750		270	219	244.5
6	Devon Rest	4E Sangaraja Mw					40	40
7	Eat-Me Restaurant	162 Peradeniya Rd						3
8	Empire Hotel & Bakers	Peradeniya St						2
9	Five Five Nine Restaurant	559 Peradeniya Rd					96	96
10	Flower Song Chinese Restaurant	Kotugodella Vidiya						3.5
11	Foodland Hotel	Yatinuwara St						1
12	Ganesha Nandan Hotel	Peradeniya St						2
13	Kandy Corner Hotel	D.S. Senanayake St						2
14	Lake Front Hotel	Dalada Veediya						2
15	Lyon Café	27 Peradeniya Rd (by police station)					172	172
16	Milano Restaurant	60/1 Yatinuwara Veediya						1.5
17	Miyako Japanese Restaurant	47 Kings St						3
18	Muslim Hotel	Dalada St					93	93
19	New Surasa	30 George de Silva Mw					80	80
20	Olde Empire Hotel	Bet Queens Hotel & Tooth temple						3.5
21	Paiva Moghul Restaurant	37 Yatinuwara Vidiya						1, also hotel/guesthouse
22	Perera Restaurant	274/6 SWRD Bandaranaike St					179	179
23	Rams	87 Colombo St						1, 3
24	Rodney Restaurant & Bar	136 DS Senanayake St						2.5
25	Royal Garden Holding (Royal Mall)	903/18 William Gopliwa Mw	70-100	800 - 1000		145	200	172.5
26	Salgado Hotel	Kotugodella Vidiya						Rec'n Hall (restaurant), 3, 5
27	Saumya Hotel	DS Senanayake St						2
28	Senani Restaurant	30 Rajaphilla Mw					40	40
29	Shan Zhan Chinese Restaurant	679 Peradeniya Rd						3.5
30	Sri Lanka Soya Project	Kotugodella Vidiya (by YMCA)						3
31	Tiwaton Restaurant	225 Colombo St						1
32	Tiwaton Restaurant	60 Deveni Rajasinghe Mw						3
33	Victory Restaurant & Bar	Srimath Bennet Soysa St						3
34	Villa Super Mario-Mario Japanese Restaurant	60 Deveni Rajasinghe Mw						2
35	Vincy Caters	Kotugodella Vidiya						3
36	White House Restaurant	21 Dalada Vidiya					154	154
37	Woodlands Hotel	DS Senanayake St					88	88
38	Zazadis Hotel	Dalada St					80	80
39	Kalyana Bakehouse	43 Deiyannewela					32	32
40	Tambapanni Restaurant	28 Sangaraja Mw					8	8
41	W.M Wickramarathna (bakery)	116 Angarika Dharmapala Mw					16	16
42	Rathanayaka Bakery	Asgiriya					160	160
43	Peradeniya Hotel	Peradeniya Rd					144	144
44	Botanical Garden Cafeteria	Peradeniya Rd					120	120
45	SMJ Abdeen Riverside Hotel	298 Madawela Rd					80	80
46	Suwardge Hotel	186 Madawela Rd					16	16
47	Elephant Bus Hotel (River Reach)	Kudu Rattle Watte					NA	NA
48	HM Palli Hotel	131 Madawela Rd					16	16
49	M Kaleel Hotel	141 Madawela Rd					32	32

No	Restaurant/bakery	Address	No of	Cust/d	Waste disposal (kg/d)		Comments	Tel
50	Samarakoon Restaurant	280 Katugastota Rd			24	24	5	
51	Malika Hotel	New Town, Katugastota			NA	NA	5	
52	Sunrise Restaurant	Madawala Rd, Katugastota			16	16	5	
53	Samin Hotel	73/7 Madawala Rd, Katugastota			24	24	5	
54	Niwasila Hotel	39/A Madawala rd, Katugastota			16	16	5	
55	New Pilawus Hotel	12 Kurunegala Rd, Katugastota			48	48	5	
56	New Royal Bakery and Hotel	17 Kurunegala Rd, Katugastota			64	64	5	
57	Kelum Pastry shop	22 Galagedera Rd, Katugastota			16	16	5	
58	New Palace Hotel	28 Kurunegala Rd, Katugastota			24	24	5	
59	BA Perera Hotel	37 Kurunegala Rd, Katugastota			16	16	5	
60	Janahita Hotel	23 Katugastota Rd, Katugastota			16	16	5	
61	MNM Thasamee Hotel & Bakery	123 Madawala Rd, Katugastota			24	24	5	
62	Majestic Hotel and Bakery	114 Madawala rd, Katugastota			24	24	5	
63	Nimal Bakery	46/69 Wattarantenna, Kandy			32	32	5	
64	Midland Bakery	71 Madawala Rd, Katugastota			40	40	5	
65	Coonhill Bakery	Dalada Veediya			97	97	5	
66	Delight Bakery & Sweet House Pvt ltd	Dalada Veediya			160	160	5	
67	Suncity Hotel	Dalada Veediya			96	96	5	
68	Sinhala Jathika Hotel	Dalada Veediya			63	63	5	
69	Kandy Café	Dalada Veediya			46	46	5	
70	Jaiwas Hotel	Yatinuwara St			120	120	5	
71	Panda Restaurant	Yatinuwara St			60	60	5	
72	Delight Bakery	Colombo St			182	182	5	
73	Bentota Bakehouse	Kotugodella St			195	195	5	
74	World Ampayar Hotel	DS Senanayake St			196	196	5	
75	Ampeyar Bakery	Peradeniya Rd			160	160	5	
76	Orchid Hotel	Peradeniya Rd			188	188	5	
77	Cityland hotel	113/24 Goodshed, Kandy			160	160	5	
78	Siripura hotel	274/6 Goodshed, Kandy			165	165	5	
79	Siri Ramya Hotel	Station Rd, Kandy			150	89	119.5	5
80	Hotel near Torrington Rd	Torrington Rd			NA	NA	5	
81	Prince Corner Hotel and Bakery	Katugastota Rd, Kandy			176	176	5	
81	Total					4996		

## Notes:

avg waste collection rate = 61.7 kg/shop.d

1. Restaurant names from Lonely Planet, 7th edition, 1999
2. From Carekleen contract, Attachment 3
3. From KMC Hotels/guesthouses/restaurants file
4. EI = eat-in, LP = lunch packet, SE = small eats
5. Data from KMC large waste generator survey, including waste collection amount estimates
6. Kandy D.S. trade licence breakdown data lists 29 hotels + 35 restaurants = 64 - hence above list is considered reasonably complete.

## b. Guesthouses

No	Guesthouse	Address	No of rooms	No of beds	No of staff	Waste KMC	Comments	Tel
1	Blue Haven	30/2 Poorna Lane, Kandy	7				1,2,3	08-232453
2	Bonavista	117/14 Angaraika Dharmapala Mw					3	08-23190
3	Castle Hill Guesthouse	22 Rajapihilla Mw	4				1,2,3	08-224376
4	Hill Way Tour Inn	90A/1/1 Rajapihilla Mw	5				3	08-225430
5	Hotel Sunray	117/8 Angaraika Dharmapala Mw	12				2,3	08-22207
6	Ivy Bank Tourist Guesthouse	52 Sangaraja Mw	7	14-21		16	1,2,3	08-234667
7	Kandy Holiday Home	51/30 Bangalawatte, Lewella	7				2,3	08-232739
8	Kathmale Holiday Resort	Riverside, Mawathura	16				2	054-22206, 054 22207
9	Lake Inn	43 Saranankara Rd	8				1,2,3	08-222208
10	Lake Mount Tourist Inn	195A Rajapihilla Mw	8				1,3	08-233204
11	Lake View Rest	71A Rajapihilla Mw	18				1	08-232034
12	Majestic Tourist Guesthouse	83/40 Ampitiya Rd, Kandy	12				2	074-472425
13	McLeod Inn	65A Rajapihilla Mw	8				1	08-222832
14	Olde Empire Hotel	21 Temple St	6				1,2,3	08-224284
15	Orchid Rest	291 Peradeniya Rd	8				2,3	08-232303
16	Prof B.R.R.N. Mendis	9/4 Keerthi Sri Rajasinghe Mw					3	
17	Regent Lodge	172 Riverdale Rd, Anniwatte	8				2,3	08-232032
18	Royal Tourist Lodge	93 Rajapihilla Mw	4	n/a	n/a		2,3	08-33364
19	Sandekelum Tourist guesthouse	29 Park Drive, Dangolla	15				2,3	08-225167
20	Sandy River Inn	16/1 Deveni Rajasingha Mw	8				2,3	08-389876
21	Scenic Summit	102/95 Hewaheta Rd, Talwatta	6				1,2,3	08-232636
22	Suisse View Holiday Home	32/40 Sangaraja Mw	4				1,3	08-223246
23	Sunny Lanka	532/24 Sceble Pl	7				2,3	08-22186
24	Thambapanni Guesthouse	28 Sangaraja Mw	5				2	08-223234
25	The Fair Havens	47 Sri Kudaratwatte Mw	10				2,3	08-223555
26	The Palanquin	253/2 Katugastota Rd	10				2,3	08-233169
27	Unique View Hotel	114, 2nd lane, George E de Silva Mw					3	08-22619
28	Villa 94	94 George E de Silva Mw					3	08-25231
29	YMCA	Kotugodella Vidiya					1	08-223529
30	Waterfront	241 Katugemunu Mw	16				2	08-22854
31	Zurich Park Hotel	184 Madawala Rd, Katugastota	6				2	08-499603
32	Pink House	15 Saranankara Rd					1	
33	Starlight Guesthouse	Next door to Pink House		5	10		1	08-233573
34	Freedom Lodge	Saranankara Rd		3	6		1	08-223506
35	Golden View Rooms	46 Saranankata Rd		4	8		1	074-471922
36	Expeditor	58 Saranankara Rd					1	070-800611
37	Thilini	60 Saranankara Rd		2			1	08-224975
38	The Heights	Saranankara Rd					1	08-233778
39	Lakshmi Guest House	Saranankara Rd		5			1	08-222154
40	Sharon Inn	59 Saranankara Rd		15			1	08-222416, 222446
41	Lake Bungalow	22/2 Sangaraja Mw		5	10		1	08-22075
43	Windsor Castle Hotel	40/2 Ampitiya Rd					1	08-224386
44	Royal Tourist Lodge	93 Rajapihilla Mw					1	08-222534
45	Ivy Banks Resort	68 Rajapihilla Mw		5			1	08-234667
46	Green Woods	34A Sangamitta Mw					1, sign exists but not confirmed if st	070-800674
47	Little Nest	Next to Green Woods					1, sign exists but not confirmed if still GH	
48	Mrs Yamuna Jayasundera	Sangamitta Mw					1	08-227158
49	Mrs Clement Dissansayake	18 First Lane, Dhammaraja Rd		6	12		1	08-225468
50	Travellers Nest	117/4 Anagarika Dharmapala Mw					1	08-222633
51	Gem Inn II	102/90 Hewaheta Rd, Talwatta					1	08-224239
52	Joe Nanayakkara's	29 Gemunu Mw					1	08-234767
53	Stone House Lodge	42 Nittawella Rd		4			1	08-232769
	Total							

Not sure how many of the guesthouses below this line still exist.

Notes: Details from 1 = Lonely Planet, 7th edition, 1999; 2 = KMC Hotel/guesthouse/restaurant file; 3 = Sri Lanka tourism Board Guide, May-Oct 2002



**c. Mining, Quarrying and Manufacturing Operations (Rural sector)**

Industry	Activity	Enterprises	Workers
Mining/Quarry	Other mining and quarrying	8	51
Manufacturing	Food products and beverages	54	171
	Tobacco products	3	8
	Textiles	9	77
	Wearing apparel dressing and dyeing of fur	40	484
	Wood & wood products, except furniture	10	23
	Paper & paper products	5	13
	Publishing, printing & reproduction of recorded media	4	15
	Chemicals & chemical products	16	50
	Rubber & plastic products	4	9
	Other non-metallic mineral products	21	246
	Fabricated metal products, except machinery & equipment	10	22
	Manufacture of furniture, manufacturing N.E.C	36	110
	Other products	7	33
	Kandy Four Gravats & Gangawata Korale D.S.		227

**Notes:**

1. Kandy Four Gravats & Gangawata Korale D.S. make up 95.4 % of KMC population. Hence, above will be a slight under-estimate of the number of mining, quarrying and manufacturing operations in KMC area.
2. Source = Non-agricultural Economic Activities Report (Rural Sector only), 1995, Dept of Census & Statistics, Kandy District

**d. Distribution of licensed enterprises in the trade sector by sub-sector and D.S. division (Kandy D.S.)**

Sector	Activity	No of enterprises	Tax Revenue (Rs)	Total no of enterprises	Tax Revenue (Rs)
Trade	Food/agro products	1017	817775	2086	2702562
	Chemical/natural based products	22	21200		
	Mineral based products	219	448747		
	Hardware/electrical products	272	531940		
	Wood/paper. Etc. products	91	170450		
	Textile/leather/synthetic products	294	477950		
	General retail	134	185850		
	General wholesale trade	37	48650		
Service	Hotel/restaurant	177	249450	726	1100950
	Repair service	264	431350		
	Finance/information service	81	162900		
	Transport	23	78100		
	Construction	0	0		
	Health	97	70100		
	Entertainment	84	109050		
	Other	0	0		
Processing & production	Agro/food based industry	164	121700	598	637700
	Mineral based industry	9	11800		
	Metal based industry	100	112650		
	Wood based industry	21	35300		
	Textile/garment based industry	241	261950		
	Other	63	94300		
<b>Total</b>		<b>3410</b>	<b>4441212</b>	<b>3410</b>	<b>4441212</b>

**Notes:**

1. Kandy D.S. only
2. Source: Analysis of 1994 Trade Licence Records in the Central Province, Joint Inventory

e. Trade Licence Breakdown, Kandy D.S.

ID No	Activity	No of enterprises			Avg tax rate per enterprise	Total tax revenue
		Trade	Service	Prod'n & D		
7	Aluminium items and iron			38	1000	38000
9	Animal foodshop	11			1059.09	11649.99
12	Antique shop	1			750	750
18	Atapirikara (Monk's robes, etc.)	4			2050	8200
24	Bakery			40	565	22600
26	Bank			4	3000	12000
28	Batik shop			13	1234.62	16050.06
29	Battery charging			10	585	5850
30	Battery store 'Eveready'	3			166.67	500.01
31	Beauty Centre			1	3000	3000
33	Beedl making			4	637.5	2550
35	Beef & mutton stall	17			25	425
38	Bear store	1			2500	2500
40	Betel sales	2			200	400
47	Bicycle Spare parts			7	1114.29	7800.03
51	Boutique	182			929.4	169150.8
53	Brass copper industry			2	600	1200
68	Building material shop	61			1633.61	99650.21
73	Buying centre	5			950	4750
76	Camera Repairs & Studio			9	838.89	7550.01
78	Canteen	48			403.13	19350.24
79	Car sale	33			2775.76	91600.08
83	Carpentry workshop			2	1500	3000
85	Carving items			11	1163.64	12800.04
89	Cement blocks	2			1100	2200
91	Cement good production			3	466.67	1400.01
96	Ceramic goods	1			1000	1000
107	Chocolate store	1			400	400
114	Clay products	2			1100	2200
118	Coca-cola Distributors	7			1028.57	7199.99
126	Coconut dealer	1			800	800
127	Coconut oil centre	9			1083.33	9749.97
132	Coir			3	366.67	1100.01
133	Coir items and fibre goods	7			1600	11200
135	Collecting film reels	1			2000	2000
142	Communication centre			6	2166.67	13000.02
143	Computer school			12	2483.33	29799.96
144	Concrete industry			1	5000	5000
159	Cushion workshop			16	1168.75	18700
173	Drawing plans			2	500	1000
175	Driving school			5	1820	9100
184	Electrical goods & repairing			78	2085.9	162700.2
186	Electrical goods shop				1450	15950
190	Electrical workshop	11			987.5	3950
192	Electroplating workshop			10	1390	13900
201	Fancy goods shop	132			1394.7	184100.4
202	Farm			3	433.33	1299.99
208	Filling Station			12	4666.67	56000.04
209	Film dealer	3			633.33	1899.99
210	Finance & Insurance			14	2707.14	37899.96
211	Finance Institute			1	3000	3000
212	Firewood seller	23			356.52	8199.96
215	Fish stall	20			775	15500
216	Florage	1			200	200

i. Trade Licence Breakdown, KMC

No	Type
23	Aluminium and plastic items
10	agrochemicals
6	
34	Hotels and bakeries
31	bank and financial institutes
4	batik
1	Battery seller
4	Beauty centres
4	Betel and coconut
22	Brass and antiques
71	Building materials and paint
9	Confectionery
65	communication and photocopy
5	dental surgery
69	Electrical items
113	Ornaments
2	Filling stations
48	meat and fish stalls
12	illegible

ID No	Activity	No of enterprises			Avg tax rate per enterprise	Total tax revenue
		Trade	Service	Prod'n & p		
218	Florist		9		1888.89	17000.01
223	Foreign Employment Agency			13	1388.46	18049.98
226	Frozen food	108			300	32400
231	Fruit seller	7			500	3500
236	Furniture shop	53			2541.51	134700
237	Garage			38	1409.21	53549.98
247	Glass goods	7			1371.43	9600.01
261	Grill making			1	1000	1000
263	Grinding mill			23	673.91	15499.93
264	Grocery	257			1055.25	271199.3
269	Handicraft			14	1714.29	24000.06
273	Hardware shop	2			375	750
275	Hiring festival goods			4	1150	4600
279	Hotel			29	2129.31	61749.99
286	Iccream seller	2			500	1000
293	Iron goods	1			800	800
297	Jam industry			2	400	800
299	Jewelry shop	132			2323.08	306646.6
301	Joss stick production			5	610	3050
304	Kerosene oil sale	2			100	200
307	Lat			1	400	400
308	Lamp shades making			1	1200	1200
309	Land dealing office			2	200	400
312	Lathe yard			3	1833.33	5499.99
312	Lathe yard			7	1650	11550
313	Laundry			9	905.56	8150.04
316	Leather product	23			1117.39	25699.97
323	Liquor shop & restaurant	6			2416.67	14500.02
325	Lodge			51	1147.06	58500.06
328	Lottery agent	6			700	4200
331	LPG Gas			21	1392.86	29250.06
333	MEC Collecting			11	1472.73	16200.03
337	Meal packeting			1	800	800
349	Milk bar	6			791.67	4750.02
356	Motor cycle sale	1			3000	3000
358	Motor cycle spare parts			4	1000	4000
359	Motor garage			39	1478.21	57650.19
361	Motor spare parts			75	2627.87	197090.3
363	Mushroom cultivation			1	800	800
364	Music centre	1			2000	2000
365	Music instruments	1			800	800
367	Nail production			1	750	750
373	Nursery			1	200	200
377	Oilment goods	6			1050	6300
378	Old bottle collector	2			1625	3250
379	Old bottles & papers	13			1676.92	21799.96
383	Old vehicle dealer	3			3000	9000
385	Ornamental fish	5			800	4000
387	Oxygen dealer	2			1000	2000
388	PVC pipes	3			933.33	2799.99
397	Paint/varnish	29			1346.55	39049.95
398	Paint dealer	12			962.5	11550
393	Papadam product	1			800	800
395	Paper dealer	2			600	1200
401	Pawning centre	8			2187.5	17500
405	Pharmacy	47			1944.68	91399.96
406	photocopy service			2	1500	3000

No	Type
7	Artificial flowers
11	Foreign employment agencies
30	fruit
13	timber furniture
11	garage
4	mills
38	groceries
4	handicraft
	See bakeries above
4	insurance
91	Jewelry
3	laundry
14	Leather (listed 2x)
15	Bags and wallets
5	lottery
3	milk bar
74	Spare parts
29	music shops
2	music items
3	Aquariums
10	paper
8	picture framing
45	pharmacy
	see communication

ID No	Activity	No of enterprises			Avg tax rate per enterprise	Total tax revenue
		Trade	Service	Prod'n & p		
418	Polythene and plastic	13			2261.54	29400.02
430	Printer - offset	1			3000	3000
432	Printing press	13			1061.54	13800.02
434	Printing press & photocopy	43			1574.42	67700.08
438	Private hospital			7	2642.86	18500.02
447	Razors distributor	1			200	200
448	Ready made garment			71	1547.19	109849.8
448	Ready made garment			12	758.33	9099.96
451	Refrigerator repair			8	675	5400
452	Rest house			1	5000	5000
453	Restaurant			35	1282.86	44900.1
455	Retail shop	162			670.68	108650.2
463	Rubber stamps	5			920	4600
465	Saloon			64	303.13	19400.32
470	Sanitary ware	5			2640	13200
471	Sawmill			8	2437.5	19500
473	Scale repair			1	800	800
475	Science Instruments	1			800	800
477	Seal industry			3	400	1200
483	Service station			4	2300	9200
489	Shoe shop	45			1560	70200
497	Singer & USHA products	4			2625	10500
504	Snack bar	35			1165.71	40799.85
505	Soap industry			1	400	400
522	Spice shop	9			1411.11	12699.99
524	Sports goods	1			1250	1250
527	Stationery	54			1562.96	84399.84
528	Steel furniture	1			1000	1000
534	Studio			26	1846.15	47999.9
540	Sweet production			1	200	200
543	Tailor shop			92	434.78	39999.76
552	Tea kiosk	66			518.94	34250.04
554	Tea packeting	41			360.98	14800.18
560	Technical workshop			1	3000	3000
561	Telephone service			18	1972.22	35499.96
569	Textile shop	197			1700	334900
574	Timber depot			15	1836.67	27550.05
586	Tobacco production			19	1415.79	26900.01
593	Toffee production			2	1350	2700
596	Tourist lodge			14	1375	19250
602	Turf accountant	2			3500	7000
604	Typewriter repair			1	200	200
605	Tyre & tube dealer			15	2053.33	30799.95
613	Tyre tube dealer			1	300	300
616	Umbrella and bags production			3	2066.67	6200.01
619	Used goods	1			1000	1000
623	Vegetable and fruit stall	104			1229.33	127850.3
624	Vegetable stall	17			150	2550
627	Vehicle dealer	14			2528.57	35399.98
628	Vehicle repair			5	1300	6500
631	Video centre			30	1071.67	32150.1
631	Video centre			12	786.67	9200.04
632	Vulcanising			26	1176.92	30599.92
633	Watch repair			2	700	1400
638	Welding workshop			46	1173.91	53899.86
	Total	2181		706		4420563
				3395		

## Notes:

1. Kandy D.S. only
2. Source: Analysis of 1994 Trade Licence Records in the Central Province, Joint Inventory
3. Total does not quite match with table g (3410)
4. My assignment to different categories - again, totals don't quite match with table g.

No	Type
	see communication
156	Garments
107	Restaurant
407	Retail
43	Saloon
3	Security service
62	Shoes
2	shoe and bag repairs
27	Cool spots
8	snacks
3	spice
3	sports goods
53	Stationery and books
13	spectacles
25	Studios
5	eggs and jugary
11	tailoring
10	Cellphone
148	Textiles
3	transport
10	Travel agent
23	Turf accountant
4	Undertaker
3	umbrella and caps
59	Vegetable
14	Watch repairs
2159	Total

Source: KMC Accounting Section

Note: Data is not complete as total is significantly less than no of trade licences

5. Note, the following enterprises:

ID	Enterprise	No	Comments
159	Cushion workshop	16	possibly use garment waste as raw materials
378	Old bottle collector	2	Recycling
379	Old bottles & papers	13	Recycling
383	Old vehicle dealer	3	Used vehicles or demolition?
395	Paper dealer	2	possibly recycling?
418	Polythene and plastic	13	possibly some involved in recycling
619	Used goods	1	Reuse