

CHAPTER 3

HOUSEHOLD WASTE DISPOSAL OPINION AND PRACTICES

3.1 INTRODUCTION

Understanding respondents' opinions and practices in household waste disposal is important for establishing comprehensive overview of solid waste disposal issues. They affect consumption patterns and the amount and type of household wastes discarded. The volume of waste generated constitutes challenges faced by local municipalities on treatment of waste disposal. This chapter also highlights suggestions on ways to reduce wastes. The opinions of respondents on ways to overcome and manage waste disposal indirectly indicate the level of interest and concern for environmental issues.

3.2 AMOUNT OF HOUSEHOLD WASTE

Two measurements (by weight in kg and number of bags) are used to estimate the amount of household waste. The average weekly household waste is found to be approximately 8.7 kgs (excluding bulky waste) whilst the median is 7 kgs (Table 3.1). On average, the respondents generate approximately 6.2 bags of rubbish per week whilst the median is found to be 7 bags per week.

The weight measurement reflects a moderate volume compared to the national average of approximately 10.5 kgs per week (the Star, 24/10/2000). It is possible that a kilogram may mean different things to different respondents. For example, the range of household waste reported by respondents varies from 1 kg to 140 kg. An attempt was made to remove outliers, with weights above 15 kgs being considered as bulky waste. Some 44 cases identified as outliers in terms of weight, result in a

median of 7kgs (no change). For the analysis of bags, responses above 20 bags are treated as outliers with the assumption that on average, respondents do not throw more than 3 bags a day. After excluding 10 cases the median is found to be 7 bags per week.

Residents in medium and high cost living quarters generate more waste (9.3 kgs) compared to those of low cost housing living quarters (7.3 kgs) (Figure 3.1). A consistent observation is reflected in terms of number of bags. Those dwelling in medium to high cost houses generate more wastes (6.4 bags) compared to respondents of low cost houses (5.7 bags) (Figure 3.2). Assuming that types of living quarters correspond with income level, this is consistent with the hypothesis that households of higher income generate more wastes.

FIGURE 3.1: AVERAGE WEEKLY HOUSEHOLD WASTES (KGS) BY TYPE OF LIVING QUARTERS

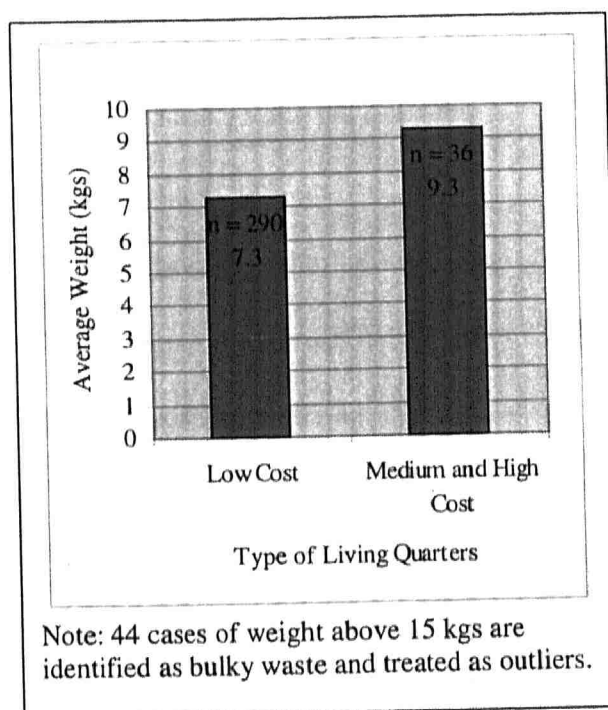
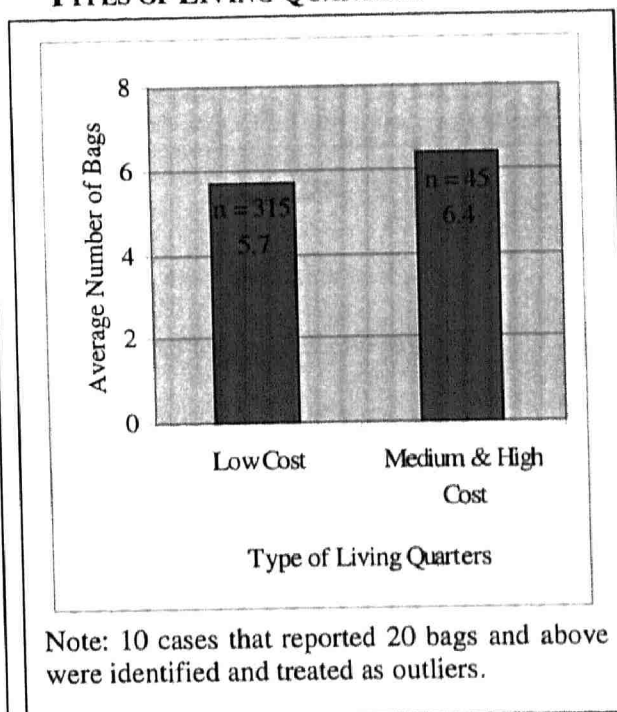


FIGURE 3.2: AVERAGE WEEKLY HOUSEHOLD WASTES (BAGS) BY TYPES OF LIVING QUARTERS



Residents generate more wastes compared to those of rented residences, again supporting the hypothesis that greater wealth may generate more wastes (Figure 3.3). Based on average number of bags, wastes generated between owners and tenants are similar (Figure 3.4).

FIGURE 3.3: AVERAGE WEEKLY HOUSEHOLD WASTES (KG) BY OWNERSHIP STATUS

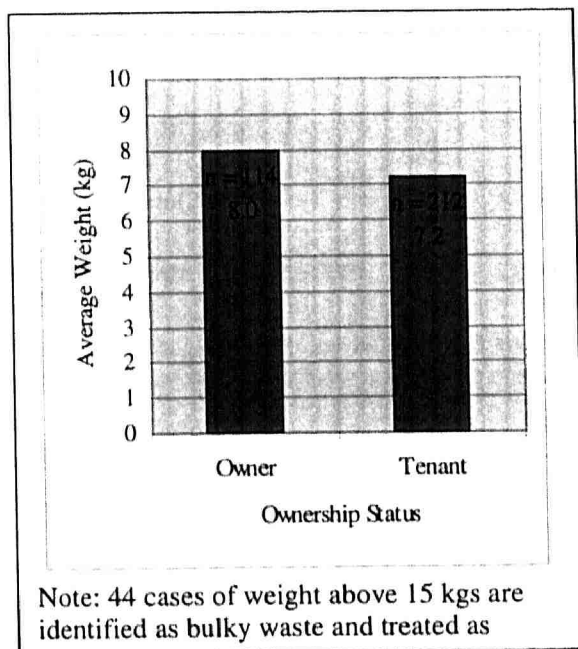
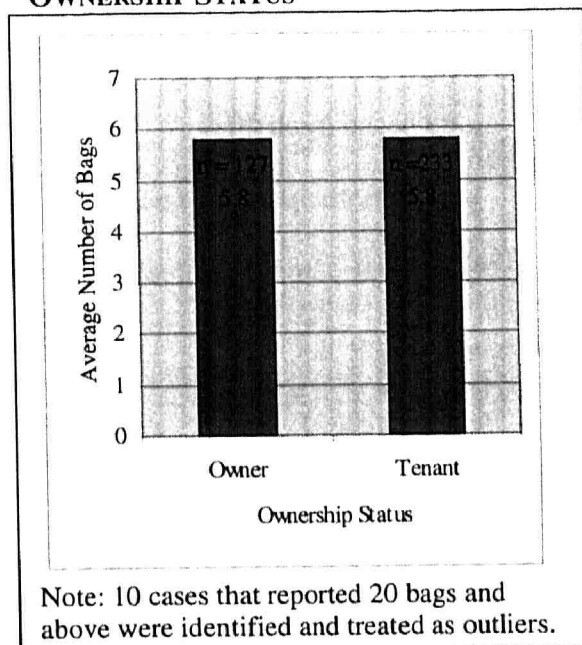


FIGURE 3.4: AVERAGE WEEKLY HOUSEHOLD WASTES (BAGS) BY OWNERSHIP STATUS



While the number of bags of household waste is an easy statistics to collect, sizes of bags may vary and hence many small bags may be equivalent to one big bag hence it may misleading as a measurement. Perhaps future surveys could standardise the size of the bag and ask respondents to estimate the number of equivalent bags. Asking households to weigh their waste disposal would be tedious. It also may end up with very varied statistics. Light items such as styrofoam and plastic that occupy landfill space and very detrimental to the environment would not be well captured. Further, such weight may vary in water and moisture content. An important consideration for future research may be to look into the household waste

composition. This would facilitate recommendations of more direct policy measures. As an illustration, if organic waste makes up 80 per cent of the average household waste composition, the policy response to focus on is to introduce composting measures.

Waste disposal varies by other socioeconomic variables such as ethnic group and household size (Tables 3.1 and 3.2). It is found that the Chinese and Malay respondents throw more waste compared to the other ethnic groups. This reflects perhaps the different lifestyles of the various ethnic groups. Nevertheless, based on a chi-square test, we reject the hypothesis that ethnic groups and living quarters (proxy of income) are independent. Hence, ethnic differences as well as income level may actually reflect differences in waste disposal behaviour.

Household size also seem to affect average weekly waste generated, with smaller households producing less waste compared to larger households (Table 3.1). However, the increase is not proportional to size, that is larger households produce less waste per capita compared with smaller households, indicating that there is economy of scale even in waste generated.

TABLE 3.1: AVERAGE WEEKLY HOUSEHOLD WASTES (KG AND BAGS) BY SELECTED CHARACTERISTICS

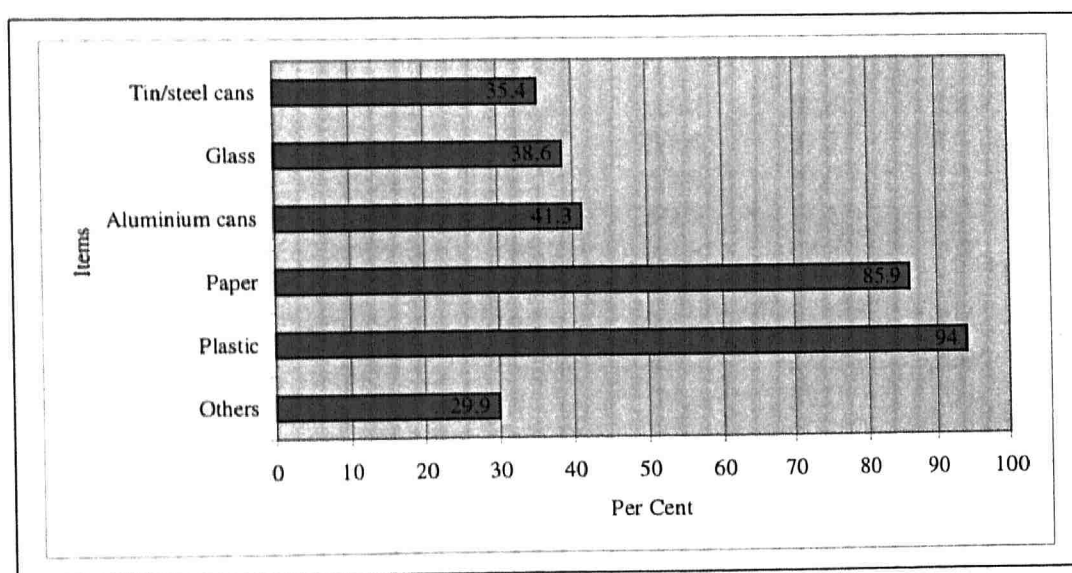
<i>Characteristics</i>	<i>Weight (kg)</i>	<i>Bags</i>	<i>n</i>
Ethnic Group	8.7	6.2	370
<i>Malays</i>	8.6	5.9	195
<i>Chinese</i>	10.4	7.6	41
<i>Indians</i>	8.4	6.5	86
<i>Others</i>	7.2	5.9	48
Household Size @	8.7	6.2	365
<i>2 and below</i>	8.1	5.0	25
<i>3 – 4</i>	9.0	5.9	111
<i>5 – 6</i>	10.4	6.6	134
<i>Above 6</i>	10.7	9.4	95

@ 5 cases did not report household size
n number of cases

3.3 CONTENT OF HOUSEHOLD WASTES

A high percentage of the respondents reported that they throw plastic (94 per cent) and paper (86 per cent) every week (Figure 3.5). Aluminium cans are reported in 41 per cent of the weekly waste disposal of households followed by glass (37 per cent) and tin or steel cans (35 per cent). Respondents also report discarding other things such as organic materials, wood and electrical appliances (30 per cent).

FIGURE 3.5: PER CENT OF RESPONDENTS BY CONTENT OF WEEKLY HOUSEHOLD WASTE



Categorising paper, aluminum, tin, glass and plastic as recyclable items, it is found that a very high percentage of the respondents (99.2 per cent) throw at least one recyclable item each week (Table 3.2). Some 90 per cent of the respondents throw at least 2 recyclable items each week. This indicates that recyclable items are widely discarded and all households should be able to contribute by recycling and conserving use of natural resources.

The variation in items discarded is significant at 5 per cent level across ethnic groups and house ownership. The Chinese respondents throw more recyclable wastes compared to other ethnic groups whereas generally, owners throw more recyclable wastes compared to tenants. This may again reflect variation in income levels rather than differences in ethnic behaviour on waste disposal.

TABLE 3.2: PER CENT OF RESPONDENTS BY NUMBER OF RECYCLABLE ITEMS THROWN WEEKLY BY SELECTED CHARACTERISTICS

<i>Characteristics</i>	<i>Number of Recyclable Wastes</i>					<i>n</i>
	<i>1+</i>	<i>2+</i>	<i>3+</i>	<i>4+</i>	<i>5+</i>	
Gender	99.2	90.3	55.4	28.6	3.5	370
Male	100.0	93.0	54.4	27.5	3.7	158
Female	98.6	88.2	56.1	32.1	4.2	212
Ethnic Group *	99.2	90.3	55.4	28.6	3.5	370
Malays	100.0	90.8	54.4	30.3	3.1	195
Chinese	100.0	95.1	63.4	39.0	7.3	41
Indians	97.7	88.4	59.3	29.1	4.7	86
Others	97.9	90.3	45.8	12.5	0.0	48
Age Group	99.2	90.3	55.4	28.6	3.5	370
30 and below	99.4	88.6	49.1	28.1	3.0	167
31 – 40	100.0	91.5	59.8	28.2	3.4	117
41 – 50	98.1	92.3	67.3	30.8	5.8	52
51 and above	97.1	91.2	52.9	29.4	2.9	34
Education	99.2	90.3	55.4	28.6	3.5	370
None	100.0	86.5	37.8	27.9	2.7	37
Primary	97.0	89.0	53.0	30.0	3.0	100
Secondary	100.0	90.4	59.0	27.7	4.8	188
Tertiary	100.0	95.6	60.0	35.6	0	45
Types of LQs	99.2	90.3	55.4	28.6	3.5	370
Low cost	99.1	86.8	54.9	27.5	3.7	324
Med. & High Cost	100.0	95.7	58.7	37.0	2.2	46
Ownership Status *	99.2	90.3	55.4	28.6	3.5	370
Owner	98.4	90.6	64.8	37.5	3.9	128
Tenant	99.6	90.1	50.4	24.0	3.3	242

* Significant difference at 5 per cent level

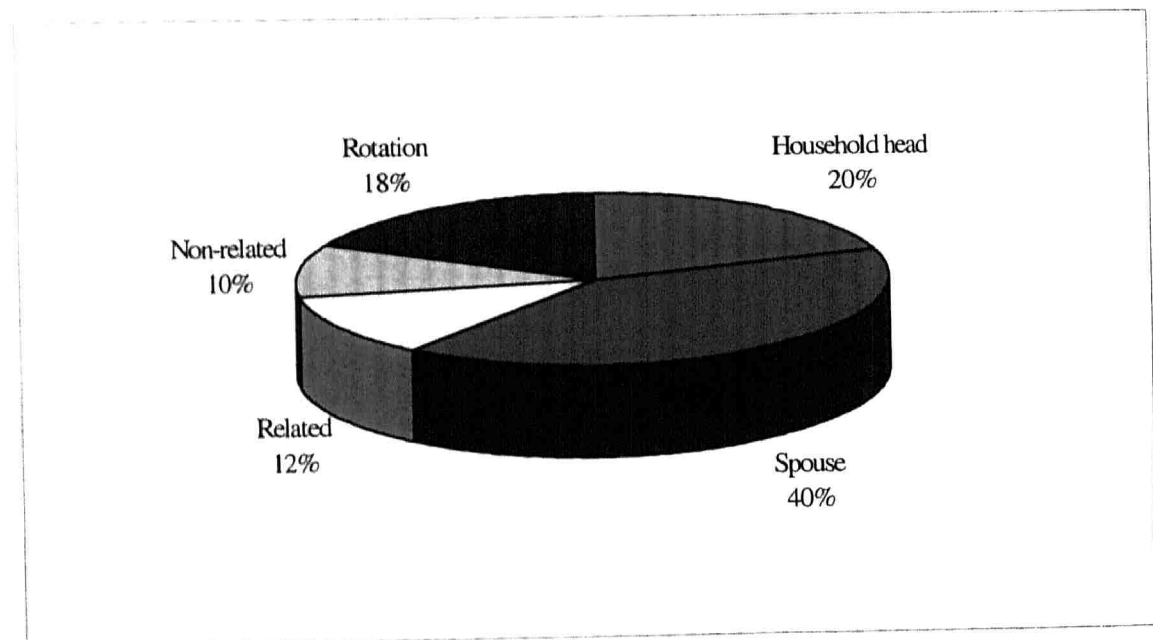
Note: LQ = living quarters

n number of cases

3.4 PERSON IN CHARGE OF WASTE DISPOSAL

Overall, the study found that 40 per cent of the respondents reported that their spouses are in charge of waste disposal followed by household heads (20 per cent) (Figure 3.6). Disposal of household waste via the rotation method makes up 18 per cent while other family members and non-relatives make up 12 and 10 per cent respectively. As household heads and spouses are the main persons in charge of waste disposal (60 per cent), this indicates that recycling programmes should target household heads and spouses to increase its effectiveness.

FIGURE 3.6: PERCENTAGE DISTRIBUTION OF PERSON IN CHARGE OF WASTE DISPOSAL



It is of interest to find out the gender of the person in charge of waste disposal. Based on the 60 per cent who reported spouse or household head being in charge of waste disposal, it is found that the majority are female (Table 3.3). This is expected as more women than men take charge of cleaning their homes.

TABLE 3.3: GENDER OF HOUSEHOLD HEADS OR SPOUSES IN CHARGE OF HOUSEHOLD WASTE DISPOSAL

Gender	Per cent	n
Male	33.8	65
Female	66.2	127
Total	100.0	192

3.5 ENVIRONMENTAL PRACTICES IN WASTE DISPOSAL

Additional thought and care in waste disposal practices could go a long way in supporting the environment. Lifestyle that reflects good environmental practices is better than just having environmental awareness; in fact it shows commitment towards environmental improvements.

3.5.1 Separation of Unwanted Items

Separation of unwanted items reflects responsible waste treatment at source. A high percentage of the respondents do not separate unwanted items (83 per cent) (Table 3.4).

This highlights the importance of promotion of separation practices to encourage recycling efforts. Variations across the selected characteristics are all not significant at 5 per cent level. Contrary to popular belief, education does not increase awareness in the adoption of this simple habit to contribute to the care of the environment.

TABLE 3.4: PER CENT OF RESPONDENTS WHO DO NOT SEPARATE UNWANTED ITEMS BY SELECTED CHARACTERISTICS

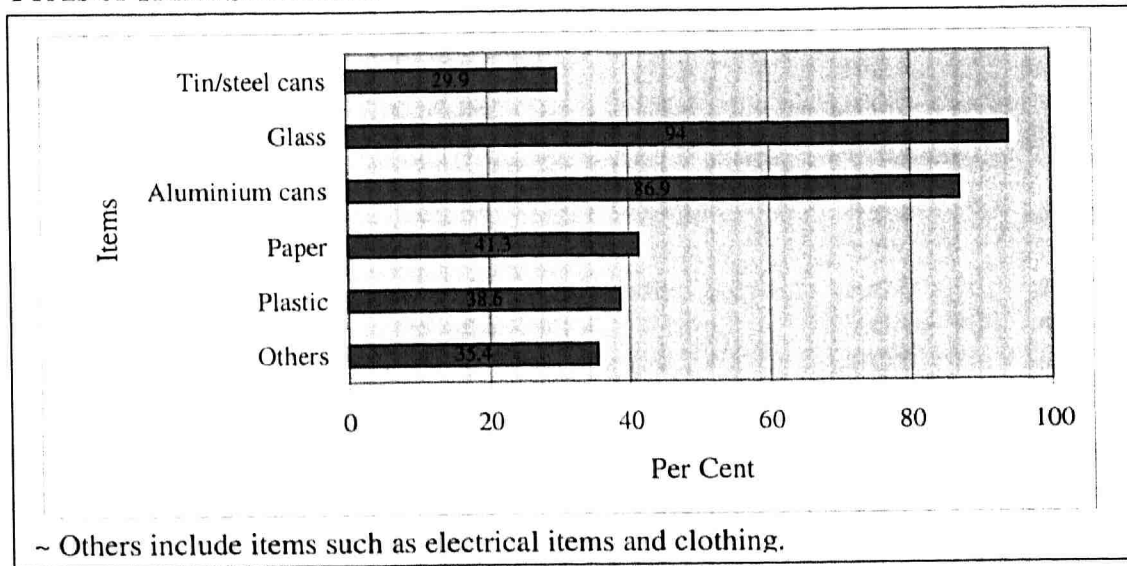
Characteristics	Per cent	n
Gender	82.7	370
<i>Male</i>	86.1	212
<i>Female</i>	80.2	158
Ethnic Group	82.7	370
<i>Malays</i>	81.0	195
<i>Chinese</i>	78.0	41
<i>Indians</i>	83.7	86
<i>Others</i>	91.7	48
Age Group	82.7	370
<i>30 and below</i>	85.0	167
<i>31 – 40</i>	83.8	117
<i>41 – 50</i>	76.9	52
<i>51 and above</i>	76.5	34
Education	82.7	370
<i>None</i>	94.6	37
<i>Primary</i>	77.0	100
<i>Secondary</i>	83.1	188
<i>Tertiary</i>	84.4	45
Types of LQs	82.7	370
<i>Low cost</i>	84.0	324
<i>Med. & High Cost</i>	73.9	46
Ownership Status	82.7	370
<i>Owner</i>	77.3	128
<i>Tenant</i>	85.5	242

n number of cases

3.5.2 Items Separated

Some 17 per cent of the respondents separate their unwanted items for recycling. The items most commonly separated are found to be glass and aluminium cans, with 74 per cent separating more than one item.

FIGURE 3.7: PER CENT OF RESPONDENTS WHO SEPARATE UNWANTED ITEMS BY TYPES OF ITEMS SEPARATED



3.5.3 Handling of Unwanted Items

More than half of the respondents discard unwanted items (65 per cent) as rubbish (Table 3.5). Only one third of the respondents contribute to some form of reuse or recycling, such as giving to charity, sending to recycling centres or selling it away. This habit is significant at 5 per cent level by ethnic group, education and type of living quarters. Different ethnic groups treat unwanted items differently. The study found that the Chinese are most likely to send unwanted items for recycling or reuse followed by Malays.

The study found that those of higher education are more likely to reuse and recycle unwanted items. For example, 42 per cent of the respondents with tertiary education reuse and recycle unwanted items compared to 32 per cent of those without education. The study also found that residents of medium to high cost houses are more likely to recycle and reuse unwanted items compared to residents of low cost houses.

TABLE 3.5: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY METHOD USED TO HANDLE UNWANTED ITEMS BY SELECTED CHARACTERISTICS

<i>Characteristics</i>	<i>Throw/ Discard</i>	<i>Reuse & Recycle</i>	<i>Total</i>	<i>n</i>
Gender	65.0	35.0	100.0	369
Male	65.6	34.4	100.0	157
Female	64.6	35.4	100.0	212
Ethnic Group *	65.0	35.0	100.0	369
Malays	65.5	34.4	100.0	195
Chinese	43.9	56.1	100.0	41
Indians	68.6	31.4	100.0	86
Others	74.5	25.5	100.0	47
Age Group	65.0	35.0	100.0	369
30 and below	63.5	36.5	100.0	167
31 – 40	65.5	34.5	100.0	116
41 – 50	65.4	34.6	100.0	52
51 and above	70.6	29.4	100.0	34
Education *	65.0	35.0	100.0	369
None	67.6	32.4	100.0	37
Primary	80.0	20.0	100.0	100
Secondary	58.3	41.6	100.0	187
Tertiary	57.8	42.2	100.0	45
Types of LQs *	65.0	35.0	100.0	369
Low cost	67.8	32.2	100.0	323
Med. & High Cost	45.7	54.3	100.0	46
Ownership Status	65.0	35.0	100.0	369
Owner	69.5	30.5	100.0	128
Tenant	62.7	37.3	100.0	241

* Significant difference at 5 per cent level.

Note: 1 respondent did not provide an answer to this question.

n number of cases

3.5.4 Recycling Practices

Recycling helps reduce stress on natural resources and relief pressure for more landfill space. A high percentage of respondents amongst the squatter communities do not send household waste for recycling (Table 3.6). This is consistent with the earlier finding that 82 per cent of the respondents do not separate unwanted items (Table 3.4).

TABLE 3.6: PER CENT OF RESPONDENTS WHO DO NOT RECYCLE UNWANTED HOUSEHOLD ITEMS BY SELECTED CHARACTERISTICS

Characteristics	Per cent	n
Gender	88.6	370
Male	89.2	158
Female	88.2	212
Ethnic Group *	88.6	370
Malays	87.7	195
Chinese	75.6	41
Indians	90.7	86
Others	100.0	48
Age Group *	88.6	370
30 and below	92.2	167
31 – 40	88.9	117
41 – 50	86.5	52
51 and above	73.5	34
Education	88.6	370
None	86.5	37
Primary	91.0	100
Secondary	88.8	188
Tertiary	84.4	45
Types of LQs *	88.6	370
Low cost	90.1	324
Med. & High Cost	78.3	46
Ownership Status *	88.6	370
Owner	83.6	128
Tenant	91.3	242

* Significant difference at 5 per cent level.
n number of cases

The differences are significant at 5 per cent level for ethnic group, age, type of living quarters and ownership status. Among the various ethnic groups, the Chinese are more likely than others to send items for recycling. Younger respondents are less likely to send materials for recycling. For example, 92 per cent of the respondents below 30 years of age do not send items for recycling compared to 74 per cent of respondents above 50 years. A higher percentage of the respondents from low cost

housing and rented accommodation do not send things for recycling compared to their counterparts.

Knowledge of Recycling Centres

One main reason for not recycling is perhaps not being aware of recycling locations. About 87 per cent of the respondents do not know the location of recycling centres (Table 3.7). The nearest recycling point within the vicinity of the communities is One Utama Shopping Complex. The other recycling centres nearby include the Damansara Jaya Community Recycling Centre and the Petaling Jaya Environment Centre in Section 17, Petaling Jaya.

The difference is significant at 5 per cent level across ethnic group and ownership status. The Chinese and Indian respondents are more likely to know about the location of recycling centres than the Malays. In terms of home ownership, owners are more likely to stay in the area for a longer period than tenants and hence they are more aware of the surrounding areas and the presence of recycling centres.

Another reason contributing to the low recycling rates may be the fact that a high proportion of the respondents have never volunteered at recycling centres. Only 6 per cent of the respondents have volunteered at recycling centres.

In order to encourage recycling practices, the squatter communities need to be made aware of the location of recycling centres and encouraged to help there. It may be necessary that the location of recycling centres need to be convenient enough for people to send recyclable materials.

TABLE 3.7: PER CENT OF RESPONDENTS WHO ARE NOT AWARE OF RECYCLING CENTRE LOCATIONS BY SELECTED CHARACTERISTICS

Characteristics	Per cent	n
Gender	87.0	370
Male	83.5	158
Female	89.6	212
Ethnic Groups *	87.0	370
Malays	89.7	195
Chinese	78.0	41
Indians	77.9	86
Others	100.0	48
Age Group	87.0	370
30 and below	90.4	167
31 – 40	88.0	117
41 – 50	76.9	52
51 and above	82.4	34
Education	87.0	370
None	86.5	37
Primary	90.0	100
Secondary	87.2	188
Tertiary	80.0	45
Types of LQs	87.0	370
Low cost	87.7	324
Med. & High Cost	82.6	46
Ownership Status *	87.0	370
Owner	76.6	128
Tenant	92.6	242

* Significant at 5 per cent level
n number of cases

3.6 OPINION OF WASTE DISPOSAL PRACTICES

Views on waste disposal practices may highlight ways to address such issues. When asked an open-ended question of what respondents view as problems of waste disposal in their community, more than half of the respondents report that there are no problem with garbage disposal (Table 3.8). About 24 per cent consider the collection system (operations and facilities) as the main problem in waste disposal. Only 12 per

cent acknowledge human attitudes and environmental impacts of waste disposal to be main problems.

TABLE 3.8: PERCENTAGE OF RESPONDENTS ON THE PROBLEMS OF WASTE DISPOSAL BY SELECTED CHARACTERISTICS.

<i>Characteristics</i>	<i>No problem</i>	<i>System</i>	<i>Env. Impacts & Attitude</i>	<i>Do not know</i>	<i>Total</i>	<i>n</i>
Gender	55.7	24.1	11.9	8.4	100.0	370
Male	53.3	25.5	12.7	8.5	100.0	212
Female	58.9	22.2	10.8	8.2	100.0	158
Ethnic Group*	55.7	24.1	11.9	8.4	100.0	370
Malays	45.6	28.7	13.3	12.3	100.0	195
Chinese	63.4	19.5	12.2	4.9	100.0	41
Indians	61.6	24.4	9.3	4.7	100.0	86
Others	79.2	8.3	10.4	2.1	100.0	48
Age Group	55.7	24.1	11.9	8.4	100.0	370
30 and below	50.9	26.3	12.6	10.2	100.0	167
31 – 40	62.4	21.4	8.5	7.7	100.0	117
41 – 50	51.9	28.8	13.5	5.8	100.0	52
51 and above	61.8	14.7	13.6	5.9	100.0	34
Education *	55.7	24.1	11.9	8.4	100.0	370
None	54.1	16.2	16.2	16.1	100.0	37
Primary	64.0	25.0	6.0	5.0	100.0	100
Secondary	56.4	21.8	13.3	8.5	100.0	188
Tertiary	35.6	37.8	15.6	11.1	100.0	45
Types of LQs	55.7	24.1	11.9	8.4	100.0	370
Low cost	55.6	25.6	11.1	7.7	100.0	324
Med & High Cost	56.5	13.0	17.4	13.0	100.0	46
Ownership Status	55.7	24.1	11.9	8.4	100.0	370
Owner	57.8	28.1	9.4	4.7	100.0	128
Tenant	54.5	21.9	13.2	10.3	100.0	242

* Significant difference at 5 per cent level.
n number of cases

Classification by selected characteristics revealed that the differences are significant at 5 per cent level for ethnic group and education. Malays are most likely to be concerned with the problems of waste disposal than other groups. As ethnic groups may reflect variations in income, it may be income levels that are causing the

differences. Some 14 per cent of Malay respondents acknowledge environmental impacts and human attitudes as being responsible for waste problems compared to lower percentages for other ethnic groups.

Respondents of higher education levels are more aware of waste disposal problems. For example, 16 per cent of the respondents with tertiary education identified human attitudes and environmental impacts as problems of waste disposal compared to respondents with primary education (6 per cent). It is of interest to note that more than 16 per cent of respondents with no education and 11 per cent of those with tertiary education do not know about problems of waste disposal.

When asked about suggestions to improve waste management in their housing areas the respondents varied from more frequent garbage collection, '*gotong-royong*', to providing more garbage bins. For ease of comprehension, the suggestions are categorised into two: (1) *improvement of system* and (2) *encouraging participation and changing attitudes*.

The findings imply that the majority of the respondents view external factors for waste disposal improvements. Only a small proportion acknowledges that actions have to be taken by the community themselves to be able to improve solid waste management effectively. The study found that differences are significant at 5 per cent level for ethnic group.

Almost half (47 per cent) of the respondents do not have any suggestions (Table 3.9). The other 40 per cent suggested waste collection system be improved as a means of addressing waste disposal problems. These include efforts to ensure more bins are available and more frequent waste collection. Only 12 per cent suggested community participation such as through '*gotong-royong*' and change in attitude to improve waste disposal management.

TABLE 3.9: PERCENTAGE DISTRIBUTION OF RESPONDENTS BY SUGGESTIONS FOR WASTE MANAGEMENT IMPROVEMENTS IN THEIR HOUSING AREAS BY SELECTED CHARACTERISTICS

<i>Characteristics</i>	<i>No suggestions</i>	<i>Improvement of system</i>	<i>Community & attitude</i>	<i>Total</i>	<i>n</i>
Gender	46.8	41.1	12.2	100.0	370
Male	43.0	44.9	12.0	100.0	158
Female	49.5	38.2	12.3	100.0	212
Ethnic Group*	46.8	41.1	12.2	100.0	370
Malays	42.1	45.1	12.8	100.0	195
Chinese	56.1	39.0	4.9	100.0	41
Indians	43.0	38.4	18.6	100.0	86
Others	64.6	31.3	4.2	100.0	46
Age Group	46.8	4.1	12.2	100.0	370
30 and below	43.1	43.7	13.2	100.0	167
31 – 40	50.4	42.7	6.8	100.0	117
41 – 50	44.2	36.5	19.3	100.0	52
51 and above	55.9	29.4	14.7	100.0	34
Education *	46.8	41.1	12.2	100.0	370
None	62.2	21.6	16.2	100.0	37
Primary	51.0	36.0	13.0	100.0	100
Secondary	46.3	43.6	10.1	100.0	188
Tertiary	26.7	57.8	15.5	100.0	45
Types of LQs	46.8	41.1	12.2	100.0	370
Low cost	46.3	41.4	12.3	100.0	324
Med. & High Cost	50.0	39.1	10.9	100.0	46
Ownership Status *	46.8	41.1	12.2	100.0	370
Owner	41.4	39.1	19.5	100.0	128
Tenant	49.6	42.1	8.3	100.0	242

* Significant difference at 5 per cent level.
n number of cases

3.7 CONCLUSION

The finding shows that the average waste generated at the squatter communities is below the national average with respondents of medium and higher cost housing in general generating more waste. This is consistent with the hypothesis that more affluent respondents would generate more waste. Almost all of the respondents' weekly household wastes contain at least one recyclable material with

paper and plastic as the most commonly discarded. Environmental friendly waste practices are found to be generally low amongst the respondents. Most of the respondents do not think that there are any waste disposal problems and hence do not provide suggestions for waste disposal improvements. Only a small number view community action and change of human attitudes as effective ways of addressing waste problems.

Consistent with the hypothesis, this study found that there are more females compared to males in charge of waste disposal. The analysis also shows that respondents do not link waste disposal practices to environmental impacts. It also shows that only a small portion of the respondents practise environmental friendly waste disposal practices such as separation, recycling and reuse of unwanted items. Hence, this points to the fact that there are extensive opportunities to inculcate environmental awareness and practices amongst the squatter communities. In addition, rubbish is presently grouped and discarded at a common rubbish dumpsite in the village. Hence, improvements to the present rubbish collection in incorporating recycling facilities coupled with awareness raising efforts and incentive measures could help organise and promote the separation and collection of recyclable items.