



Waste Management and Recycling Audit

Wonderland Villas, Kwai Chung

Le Sommet, Fortress Hill

San Wai Court, Tuen Mun

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Executive Summary

The private sector has a crucial role to play in reducing and managing waste better. In terms of household waste, private sector developers and residential management companies can do a lot to help reduce, reuse and recycle. Not only do they manage a substantial chunk of Hong Kong private housing estates, but private sector management companies are also supervising an increasing number of public housing estates.

Civic Exchange carried out a series of audits and surveys in three Hong Kong residential blocks, two private estates and one public housing estate, between July and October 2001 to find out about waste compositions and existing recycling habits and facilities in order to see how waste management systems can be improved. The information gathered is likely to be typical of Hong Kong as a whole.

The overall results can be summarized as follows:

Property Management

- A committed housing manager is vital for change as its cooperation is essential for continuous improvement;
- Residents/owners and the housing management need to work together to set the right financial incentives to create a win-win formula so that all the stakeholders benefit in the long-term as investments in time and money will be needed to improve the whole waste collection and management program;
- A committed resident/owner committee is essential to long-term success;
- Already committed residents/owners can be assisted in their efforts by helping them to build the capacity to be more effective “change agents” to attract new participants to join existing recycling schemes.

Public Awareness

- Sustained efforts to remind those who are already recycling and to attract new participants are vital to increase recycling quantities;
- The importance of recycling to better waste management is already generally known among Hong Kong residents from government public education information, the media, school, and from overseas experience for those who have spent time abroad;
- Methods and styles of public education programs need to be better developed to spread the message and sustain long-term behavior change;
- Household surveys on waste disposal habits are useful to identify how to encourage higher levels of recycling.

Collection Systems

- Collection systems need to be made as convenient as possible to increase recycled quantities;
- Attractive collection bins of the right sizes and notices for what to do placed at appropriate places will encourage recycling;
- Waste composition audits are useful to help re-design the existing collection system.

Recycling Revenue Potential

- The surveys show that considerable quantities of useful resources can be recovered that have a significant monetary value. If the residents, owners and managers can devise a way to share the recovered resources, the amounts can be ploughed back into improving the respective estates.
- Compostibles (food wastes) are a major waste source that is currently neglected because it is regarded as too difficult to deal with. With new technologies available, Hong Kong should not ignore the opportunity here for reduction;

The Waste Composition Surveys showed that much more newsprint, aluminum cans and plastic bottles can be collected with some adjustments to the existing system. At current values, this portion alone could amount to about HK\$165,442 per year for the three estates.

Potential Revenue Generation annually from all Estates (at current prices)

Newspaper – HK\$79,930.00
Aluminum Cans – HK\$59,400.00
Plastic Bottles – HK\$26,112.00

Civic Exchange, a non-profit public policy think tank, is the strategic adviser to the privately funded *Clean Environment Campaign*, and one of its goals is to better understand Hong Kong's household waste patterns in order to find ways to improve waste management and recycling.

In order to achieve this objective, *Civic Exchange* collaborated with *Sun Hung Kai Properties Ltd.* and its residential management subsidiaries, *Hong Yip Holdings Co. Ltd.* and *Hong Yip Service Co. Ltd.* to carry out three-detailed waste related surveys of three of its estates, Le Sommet, San Wai Court and Wonderland Villas. The help of *Time to Recycle Co. Ltd.* was enlisted to design and conduct the surveys and formulate the report.

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1. Introduction

1.1 Background

As the Environmental Protection Department stated in its 2001 annual report: “Waste management is at a crisis point because landfill space is running out ... The current landfills have perhaps 10 to 15 years worth of use left in them ... household waste loads have risen steadily, in line with the growth in population and wealth of the community. There is no sign of a let-up because two million more people are expected to live in the SAR by 2016.”

Currently, Hong Kong is dependent upon three mega landfills for the disposal of municipal solid waste, which are running out at a fast pace. Whilst alternate means must and are being considered by the government, the efforts by the private sector will be crucial to ensure sound waste management.

Between July and October 2001, the *Civic Exchange*, an independent public policy think tank, undertook a detailed Waste Management and Recycling Audit at three estates managed by *Hong Yip Holdings Co. Ltd.* and *Hong Yip Service Company Ltd.* (HYH), subsidiaries of Sun Hung Kai Properties Ltd. that manage residential properties. Civic Exchange’s *Clean Environment Campaign* (CEC) aims to find practical ways to help improve the environment in Hong Kong.

In order to carry out a comprehensive waste audit, it was necessary to have an estate management partner who gave the project its full cooperation. Civic Exchange is grateful for the support of HYH to survey three of the residential estates under their management. Civic Exchange collaborated with *Time to Recycle Co. Ltd.* to conduct a series of waste surveys. It is hoped that the results will provide useful insights to the habits of Hong Kong residents in order to inform how waste management can be improved.

Discarded waste materials are often reusable and have proven to be a resource. CEC’s objective was to obtain a better understanding of household waste patterns in Hong Kong and to improve the performance of the waste management system by providing practical solutions that will significantly improve the level of source separation for different waste types.

This report is structured as follows:

- The first section provides the background information and overall objectives of the three surveys, including the methodology, scope of work and specific objectives.
- The second section is a detailed cross-analysis of the results from the estates, using all data tabulated from the waste composition and household surveys.
- Finally, specific recommendations for progressive improvement of the recycling infrastructure are outlined.

1.2 Characteristics of Estates Surveyed

HYH chose three very different estates for the purpose of this waste management and recycling audit for comparative purposes. Wonderland Villas, an established private estate, has 1,502 units; Le Sommet, a brand new private estate has 394 units; and San Wai Court, a public housing estate, has 2,100 units. See Appendix I for further information about the estates.

1.3 Survey Objectives and Methodology

The Study encompassed three separate but related surveys, with the following objectives:

1.3.1 Building & Operations Survey

The objectives were to:

- Assess the current building layout and waste management system for the collection, handling and transfer of the waste type;
- Provide the baseline information so as to improve the provision and extent of waste recycling facilities; and
- Assess the level of existing source separation and recycling initiatives being undertaken by the estate and the tenants so as to offer tailored solutions.

Detailed site meetings and visits were held with the estate managers and cleaning contractors to determine the functional relationship between the layout of the estate and the existing waste handling, separation, storage and transportation systems. These were held at Wonderland Villas on 10 July 2001, at Le Sommet on 12 July 2001 and San Wai Court on 11 September. The Survey was geared towards providing an overview of the key factors that influence the quantity and types of waste generated within the Estates.

1.3.2 Waste Composition Survey

The objectives were to:

- Provide a breakdown of the quantities of different specified types of waste at source;
- Define the current situation as baseline information for future monitoring and measurement of waste reduction performance; and
- Assess the potential revenue generation from the sale of recyclable material.

Waste Composition Surveys were undertaken to determine the composition of solid waste based on a random representative sample of a typical weekend day and weekday. A typical skip (large refuse container of 660litres) was chosen from the general waste and all the black bags holding the waste were taken out and emptied on to the floor. Labeled bags for 15 types of waste were laid out and the waste was separated and placed on top of each bag. After all the waste was sorted it was checked to ensure that it was of the specific type, photographed and then placed inside the labeled bags and weighed.

1.3.3 Household Survey

The objectives were to:

- Assess the level of awareness and participation in recycling activities; and
- Consider the range of comments and suggestions for improvement of the recycling infrastructure.

A questionnaire was formulated to obtain an indication of residents' support and preferences for recycling. It was delivered to every household at Wonderland Villas on Monday 9 July 2001, Le Sommet on Saturday 14 July 2001 and at San Wai Court on 28 September 2001. The questionnaire was also posted on the "superhome" Intranet service – a web site dedicated to all HYH properties.

A total of 188 questionnaires (12.5% of all households) were returned at Wonderland Villas, 109 (27.7% of all households) at Le Sommet and 68 (3.2% of all households) at San Wai Court. The percentage of returns at Wonderland Villas and Le Sommet ensures that the information received is statistically relevant. Whereas the low response at San Wai Court means that the results received can only provide an indication of the support for recycling by the residents within the estate.

The results showed a bias positive support for recycling. It may be assumed that the households that did not return a questionnaire are indifferent to recycling.

2. Survey Results and Analysis

2.1 Building & Operations Survey

The existing waste collection and handling systems at the Estates are outlined in Appendix II and waste separation at source in Appendix III. Some adjustments should improve the systems to improve the waste separation at source quite considerably.

For example, at Wonderland Villas, small, attractive, tri-compartmented recycling boxes lined with biodegradable bags could be placed in the stairwells, according to fire and environmental statutory regulations. The containers could prove to be effective in the overall education for the residents, make it easier for the cleaning contractor to pick up, and reduce contamination. There is also definitely a need for more street level facilities.

At Le Sommet and San Wai Court, small household “green boxes” could be considered. The containers would help to educate tenants, make it easier for the cleaning contractor to pick up, and improve the existing problem of source contamination. Podium and lift lobby recycling facilities would also be suggested. See Section 3 for more detailed recommendations.

2.2 Waste Composition Survey

The dates and results of the waste composition survey are presented in Appendix IV. Due to the heterogeneous nature of solid wastes, the composition is difficult to determine statistically. For this reason, generalized standard survey procedures were adopted. General analytical trends have been extracted from the results. The analysis is divided into waste types with "existing source separation" and types with "no existing source separation".

2.2.1 Existing Waste Separation at Source

General Paper

The recycling facilities at the Estates allow for the deposit of all types of uncontaminated paper in containers including separately, large “corrugated” cardboard. The Survey separated the paper waste into newspaper, high-grade paper (books, magazines and computer/photocopying), cardboard (wrapping for food and consumer products etc) and general paper (large majority is tissue).

All the Surveys clearly indicated a high level of newspaper still within the waste sample. It was clear that the majority of the newspaper was contaminated by food. It had been used to wrap the fresh food for transporting or in some cases surround food waste for disposal. The average quantity of newspaper was similar at the three estates during the weekend (9.73kg), whereas in comparison to Wonderland Villas (9.9kg) it increased at both Le Sommet and San Wai Court in the weekday survey (13.1kg). At Le Sommet and San Wai Court the level at the weekend was lower (13.5%) than during the week (19.35%). This could be due to the high readership of newspapers during the week and the lack of adequate facilities at present.

There was a high level of high-grade paper at Le Sommet (Avg. 12.0%) in comparison to the other estates. This is most probably due to the fact that there are no facilities for the collection of “all” types of waste paper, only newspaper, within Le Sommet at present. The figure at San Wai Court was not significant (Avg. 4.6%) and is expected to reduce through recycling. The starting level in terms of weight of high-grade paper is lower at San Wai Court, which is likely to be due to lower readership of magazines and usage of computer paper.

The level of cardboard packaging was relatively low at all the Estates (Avg. 2.3%) and comprised mainly ‘Tetrapak’ cartons and other consumer packaging.



Figure 1.
Contaminated Newspaper at Wonderland



Figure 2.
Aluminum Cans at Le Sommet

Aluminum Cans

The quantity of aluminum cans within the waste composition at San Wai Court is slightly higher during the week (0.7%) than the weekend (0.3%), whereas at Le Sommet the quantity is the same (Avg. 0.4%). During the weekend survey a large number of soft drink and beer cans were found. At Wonderland, the weekday level for aluminum cans was a very low (0.1%), which shows that the residents utilize the available collection facilities. However, the rate was surprisingly high over the weekend (1.5%). Since the cans came from a small number of bags, it indicated that there was a social event at one of the resident’s homes, and the bags were mixed up with the overall waste.

At Wonderland Villas and Le Sommet there are a large number of “social” events held within the clubhouse at the Estates and most probably this facility generates a large number of cans that can be collected separately.

PET Bottles

Within all the surveys there was only a residual level of PET Bottles (Avg. 0.6%). Only a small number of bottles, no more than 10, were found within each of the surveys at Wonderland Villas and Le Sommet. This clearly indicates the success of the long-term organized collection scheme at Wonderland Villas and the collection of PET bottles before the beginning of the recycling containers at Le Sommet. At San Wai Court there was a high level during the weekend (0.6kg) and weekday surveys (1.1kg). This could be due to the fact that recycling facilities were only recently installed.

In comparison to other types of plastic waste there is minimal contamination of PET Bottles, apart from residual liquids, and they are relatively easy to store before recycling.

2.2.2 Non-Separated Waste at Source

Major Waste Types

The results clearly indicate that compostibles (food scraps) are the main overall waste type, which is generally typical of the situation in Hong Kong. It was clear from Wonderland Villas that a significantly higher percentage of food waste was found in the weekday survey (58.5%) in comparison to the weekend day survey (41.5%). San Wai Court also had lower quantity of food during the weekend (45.0%) than during the week (54.5%). This indicates

that the residents spend more time eating out during the weekend period. At Le Sommet there was only a slightly higher percentage at the weekend (48.0%) than during the week (38.5%). In all the surveys there were residual quantities of contaminated paper and plastic mixed in with the food.

In many respects, the second major waste type is "associated" with compostibles. LDPE waste is synonymous with food packaging and carrier bags for food and in the majority of cases is contaminated by food waste. The LDPE waste is significant in terms of volume and weight within all the surveys conducted, especially the weekend days at Le Sommet (21.5%), Wonderland (16.5%) and San Wai Court (12.0%).

Minor Waste Types

The percentages for all the other waste types are relatively low. The levels for Glass (Avg. 2.0%), HDPE (Avg. 1.0%), Other Household Plastic (Avg. 2.5%), Styrofoam (Weekday - Avg. 1.5%) and Metal - Tin Cans (Avg. 1.0%) were relatively steady. There were a few glass bottles that were mostly contaminated by food, although minimal presence of wine or beer bottles. HDPE was confined to washing-up liquid bottles etc. and Other Household Plastic includes a mixture of types. Such plastics have a relatively long-term use and are therefore less common than LDPE. Styrofoam is mostly used in "take-away" food outlets outside the Estate, although a certain amount is used for food packaging. Generally speaking, tinned food is not common in Hong Kong compared to other countries. Small amounts of textiles (Avg. 0.5%), mostly old dishcloths, were recorded at two surveys and only a few household batteries were recorded during the weekday surveys (Avg. 0.1%). There were no used computer ink cartridges within any of the surveys.

Two bags of shoes were found at Wonderland Villas during the weekend day (8.0%) and weekday (5.0%) surveys. Whereas, at San Wai Court "festival" waste from the Lantern Festival was significant and including painted coconuts (3.0%) and candle trays (2.5%).

2.2.3 Potential Waste Recycling Generation

At present there are formal and informal recycling facilities for the source separation of mixed paper, aluminum cans and plastic bottles at the Estates however the waste composition surveys clearly indicate that there is still a significant presence of these waste types within the general waste stream. Based on the average quantity of mixed paper, aluminum cans and plastic bottles weighed from the six waste surveys it is possible to indicate the potential quantity and revenue that could be generated from these waste types if they were fully separated from the general waste and recycled as shown in Appendix IV.

Currently, the cleaner who take the waste away and who work for the cleaning companies get to sell the wastes, such as paper and aluminum cans. As an incentive for them to support the recycling, part of the recycle money was used to subsidize their operation cost. This shows the current ad hoc nature of the recycling system in Hong Kong as a whole. As such, the housing management companies cannot take the proceeds from the sale of the wastes and apply this back to the estate for the benefit of the residents. It would be helpful to develop a new formula where more waste can be collected and for the proceeds to be applied back to the benefit of the residents so that the proper incentives can be worked out to increase collection. At the same time, the cleaners who have a current stake might benefit in some way so that they too have some continuing incentive.

2.3 Household Survey

The results of the Household Survey are presented in Appendix V. The survey results have clearly shown that among the respondents there is strong willingness to participate provided the recycling infrastructure is convenient and effectively communicated. It should be remembered that those households, which responded to the survey were probably already relatively more aware of recycling even though not all of them practiced recycling. As the response rates from Wonderland Villas and Le Sommet were relatively high, they could be taken to be statistically reliable. As the response rate was so low at San Wai Court the results can only provide an “indication” of the views on recycling by the residents within the estate.

2.3.1 Existing Waste Collection & Handling

An overwhelming number of respondent households at Le Sommet (98.0%) and a large majority at Wonderland Villas (80.0%) deposit their general waste in the stairwell outside their units. Nearly half of the respondents at San Wai Court deposit their waste in the stairwell (47%) and half on the ground floor level (53%). The remaining households at Wonderland Villas (20.0%) carry their waste to the ground level for collection.¹

Most households at both Wonderland (76.5%) and Le Sommet (85.0%) deposit their waste bags for collection on a daily basis while the remaining leave the rubbish out twice a week or on a weekly basis. A substantial number of respondents at San Wai Court deposit their waste on a daily basis (44.0%) and a sizeable number place their waste twice a week (22%) or on a weekly basis (20.5%).

2.3.2 Existing Source Separation

When asking the households if they separated any of their paper, aluminum cans or plastic bottles the results clearly reflected the level of recycling infrastructure within each estate. An overwhelming majority of the responding households at Wonderland Villas (90.0%) separated their paper with a significant number separating aluminum cans (60.0%) and plastic bottles (59.0%).

Whereas, at Le Sommet, where there is an incomplete recycling infrastructure, a small number of households recycle their paper (36.5%), aluminum cans (15.5%) or plastic bottles (15.5%). For the Le Sommet residents who at present recycle all three standard waste types, the large majority (84.0%) leaves the material outside their units for collection. With the installation of sets of recycling containers it is fully expected that there will be a significant increase in the number of households that will commence recycling.

The majority of respondents at San Wai Court separate their paper (89.5%), aluminum cans (78.0%) or plastic bottles (73.5%). Despite the small number of respondents, this clearly indicates the success of the recycling containers that were recently introduced.

For households who do not recycle some of the standard three waste types the main reason chosen at Wonderland Villas was that the recycling facilities were not convenient enough (39.0%). At Le Sommet a significant percentage were not aware of recycling in the estate (42.5%), which reflects the lack of formal recycling facilities at the time of the survey. The main reasons that the respondents at San Wai Court did not recycle was that the containers were not convenient enough (25%), they didn't know how to recycle (22.5%) or there was a lack of space (18.0%) in their unit. It was encouraging that despite some respondents not

¹ It should be mentioned that 24 households at Wonderland Villas leave their waste outside the unit and on the ground level. This could be a misunderstanding of the question or it implies that the household places their general waste types outside the unit and their waste types for recycling on the ground level.

knowing how to recycle they nevertheless responded to the survey, perhaps indicating that they were open to learn.

Whilst the facilities can be improved at Wonderland Villas, it appears that those householders who participate in recycling are very committed but it has not been easy for them to influence non-participating households. That is not surprising since it does require specific skills and well-targeted and sustained efforts to change other people’s behavior. With its highly committed owners’ committee, it is most likely that if the committed residents can be helped to develop skills to become effective “change agents” to influence others, they can be extremely effective in the future.

Le Sommet does not have a formal recycling infrastructure yet but its younger and relatively better educated residents should be able to do very much better once they have an established system and an owners’ committee set-up.

For many years the long-term residents at San Wai Court have been used to depositing all their waste in the stairwell, although with the new recycling facilities and the encouragement of the property management, it is only a matter of time before recycling becomes routine.

2.3.3 Infrastructure Improvements

The vast majority of respondents (90.0%) at Wonderland Villas who indicated that they do not recycle some of the standard items would be fully prepared to recycle if there was a collection point outside their unit. Whereas, when given a choice between outside their flat or downstairs, the large majority of those households who do not recycle at Le Sommet would do so if there was a container outside their unit (67.5%) or on the ground level (29.0%). The San Wai Court residents who do not recycle clearly would support the development of facilities on the ground level (41%) as opposed to outside their unit (27%).

Residents at Wonderland Villas requested that there should be collection boxes for different waste types including glass, batteries, plastic bags, clothes and various types of paper. Such requests are another sign that on the whole the residents there are more aware than at the other estates.

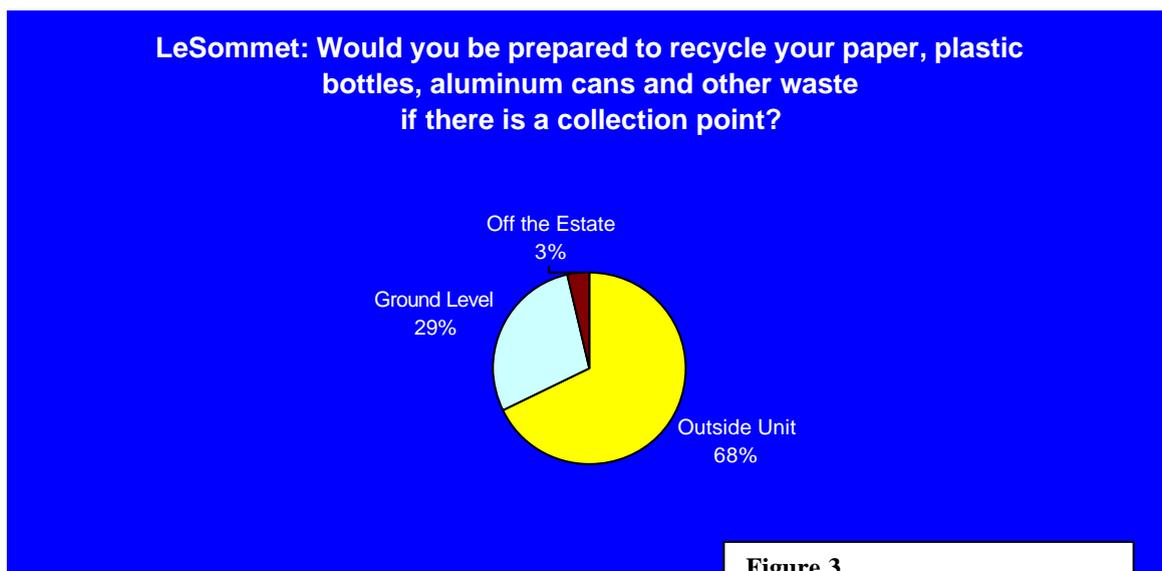


Figure 3.
Infrastructure Improvements

2.3.4 Recycling of Other Waste Types

The replies from the questionnaire clearly indicated there is a demand from residents for the formal recycling of further waste types beyond paper, aluminum cans and plastic bottles. The demand from Wonderland and Le Sommet respondents was substantial. There was a demand from San Wai Court, although there was also a large number of “no answer” that clearly indicates the lack of knowledge about recycling within the estate.

Amongst six specified waste types the highest request from households was for the recycling of clothes (Avg. 83.0%). There was also a significant demand for the recycling of computer & electronic goods (71.5%), glass (Avg. 69.5%) and batteries (Avg.64.0%). The support for the refilling of computer ink cartridges was lower (51.5%), reflecting the lower production of the waste type within the estates.

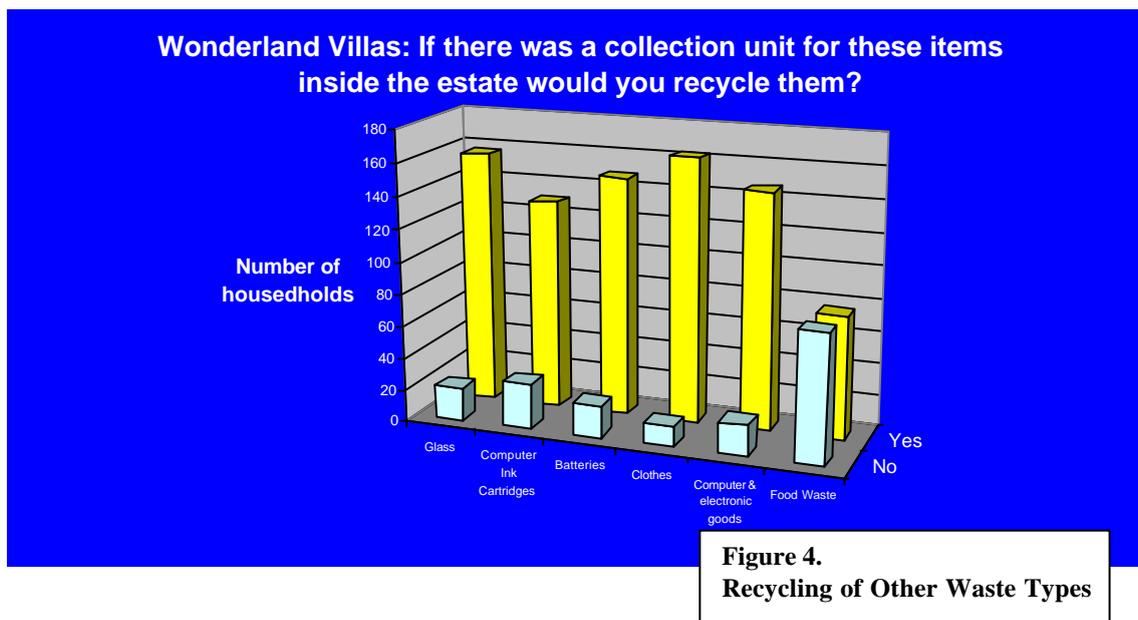


Figure 4.
Recycling of Other Waste Types

In all cases, apart from one, the demand for the recycling of more waste types was higher from respondents at Wonderland Villas than the other estates. This reflects the long-term acceptance of recycling at Wonderland Villas. Support for the recycling of old computer and electronic equipment was fractionally higher at San Wai Court. The demand for glass, ink cartridge and battery recycling was significantly higher (On Avg. 67%) from Wonderland respondents in comparison to San Wai Court.

The only waste type that did not garner strong support for recycling was food (Avg. 37.5%). This is probably due to odor problems and space issues associated with storing food waste in Hong Kong and the belief that it would be very troublesome. Both the public and private sectors should consider how to reduce this item of waste since there are now new technologies from around the world to deal with food wastes but how they can be adapted for use in Hong Kong needs to be studied.

In Wonderland Villas, a small number of households already recycle other forms of waste such as glass (6.0%) and clothes/shoes (1.5%). It is assumed that households either take the waste off the estate for recycling or reuse the material as a resource within the Farming Group or art classes as part of the on-going activities at the estate.

The Carnival organized by HYH is an important annual community event within the estates. At Wonderland Villas the event has been held for many years and during the previous two years has had an environmental theme. Le Sommet held their first Carnival in 2001, which

also had a “green” message and now doubt San Wai Court will incorporate the environment as a theme at one of their future community events.

The large majority of residents at the estates (Avg. 81.0%) would be prepared to give their secondhand items at the estate carnival for reuse by charities. Although, a significant number of residents at Wonderland Villas and Le Sommet would not be prepared to buy (Avg. 57.5%) or sell (Avg. 65.5%) second hand items themselves. Whereas, at San Wai Court there is a higher percentage of respondents who would be prepared to buy second hand goods (44%), reflecting the lower income bracket. The results clearly reflect firstly the support in Hong Kong for donating to charity and secondly the lack of tradition for trading in second hand goods.

2.3.5 Awareness and Support of Recycling

Essentially, all the respondents at the estates (Avg. 99.0%) considered recycling was important, and overwhelmingly the main reason was that it is beneficial to the environment (Avg. 97.5%). A significant number also considered that recycling was of benefit to the community (Avg. 78.5%). Whereas only slightly more than half of the respondents considered that recycling supports the economy (Avg. 57.0%), reflecting the low level of understanding of the potential of the recycling industry as an important source of employment.

Of the households who specified where they learnt to recycle many provided more than one answer. A large number of the respondents from all the estates gathered their recycling information from the government “campaigns” (Avg. 53.5%), especially at San Wai Court (62.5%). This clearly indicates the success of the government information campaigns within the public housing sector.

A smaller number of respondents at each estate specified that they had learnt about it at school (Avg. 18.0%). For the Wonderland residents, the “media” was particularly important (21.0%) and many at Le Sommet (19.0%) learnt about it in “another country”, which probably reflects the number of residents there who had spent time overseas.

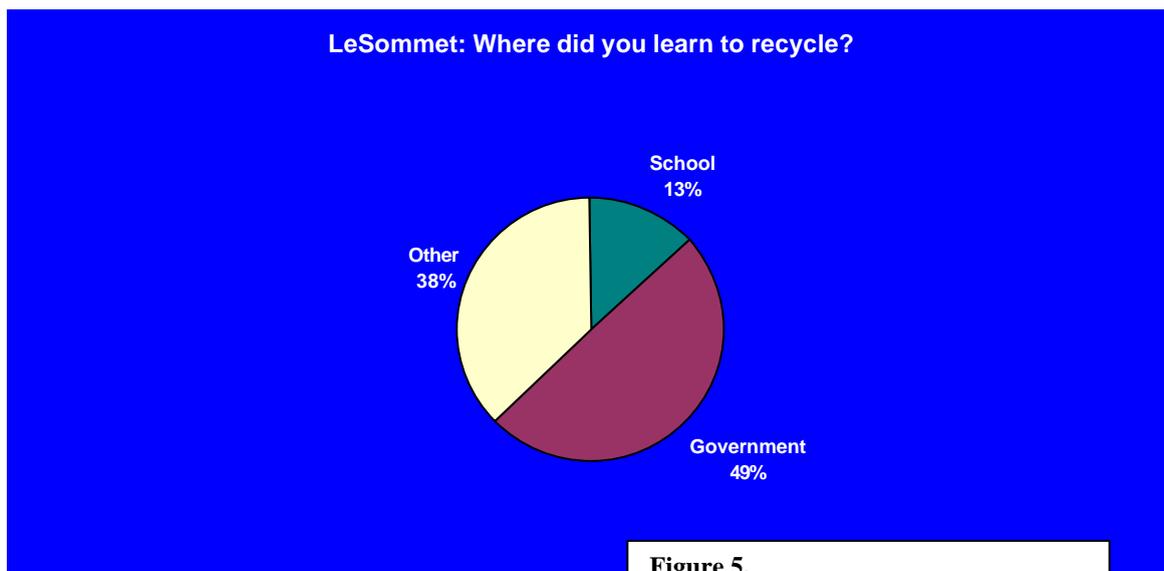


Figure 5.
Awareness and support of Recycling

A considerable number of households (Avg. 64.0%) requested that they would like to learn more about recycling. This shows the strong support for recycling and the enthusiasm from residents within all the estates.

There was mixed support for the idea to set up an environmental group within the estate at Wonderland Villas (For: 45.5% Against: 45.5%) and Le Sommet (For: 37.5% Against: 57.0%). The higher support at Wonderland could reflect the acceptance of “community” groups, such as farming and tree planting groups within the Estate. Whereas a large majority of respondents (69%) at San Wai Court wished to join a formal environmental group within their estate.

3. Conclusions and Recommendations

3.1 Introduction

There is a high level of willingness to participate provided a comprehensive waste management system is in place.

The desire from the residents for the placement of recycling containers outside their units clearly indicates that convenience is of the utmost importance. This was supported in the waste composition survey with the high level of newspaper and aluminum cans that were recorded in the general waste. For many households who do not recycle at present the main reason stated at all the estates was that they were not aware of recycling in the estate, indicating that there are good opportunities to build awareness and change behavior.

3.2 Communications and Media (December 2001 – May 2002)

In order to encourage better source separation within the households, a sustained effort to communicate with the residents is recommended. Involving young people and domestic helpers would be useful. The first opportunity should be to communicate the survey results back to the residents and then design a communication strategy over the next six months to track whether there are improvements and subsequently continue to adjust the strategy as needed.

Initial ideas for a communication strategy include:

- Development of internal promotion of recycling by estate management in association with the estate owner's committee.
- Full utilization of the information conduits such as the newsletter, notice boards and Intranet.
- Involvement of the households as a "stakeholder" in the recycling, through incentive-driven schemes such as an "inter-block" competition to see which block can collect the most refuse.
- Help the owners' committees and committed residents to become "change agents" so that they can sustain efforts to influence other residents to participate in recycling. This will involve helping them to learn presentation, meeting facilitation and overall leadership skills.

The committed residents of Wonderland Villas could become effective "change agents". HYH may consider seeking their help as "ambassadors" as it expands its recycling plans for all the estates under the company's management. Wonderland Villa's residents are already collecting a wider range of wastes than probably any other estate in Hong Kong. For example, it organizes an annual old clothes collection for charity. It is noteworthy that the efforts of the committed residents have won them a number of prizes over the years (Environmental Campaign Committee awards, including the "Five Star Estate Award"). Their continuous efforts over the years has been led by a core of long-time residents.

3.3 Recycling Facilities – Long Term

Research from other countries indicates that for people to participate in recycling programs, the containers have to be attractive, colorful and conveniently placed. They should also be easy to use, in the sense that the height, size and the opening to them should be appropriately designed. Both the location of all the containers and their signage should be fully

reconsidered. Since there are costs involved in improving the recycling infrastructure, these need to be known for HYH to assess to what extent further investments are needed and how they could be financed.

HYH may wish to engage professional help to improve the level of source separation and recycling within the estates through the provision of new containers to collect various waste types. These may include:

- Small plastic containers to be placed in convenient positions for each household. They could have three separate compartments for paper, aluminum cans and plastic bottles within which biodegradable bags could be placed for collection.
- The containers could be either placed outside the unit on each floor or in the staircase. Due to fire and access regulations the containers could be secured in a suitable position on the wall in the stairwell. Households would also have the option to place containers outside their unit if they so desired.
- More attractive recycling containers could replace the government-sponsored containers within both estates. The new containers could be designed and produced from a range of materials depending on the estates' specific needs.
- Provision of new recycling containers within central locations for the collection of clothes, batteries, computer ink cartridges, plastic bags and computer/electronic equipment.
- Investigation into the feasibility of recycling other material from the estates, which are not undertaken at present in Hong Kong, such as glass and food waste.

3.4 Overview

Based on the results of the Waste Management and Recycling Audit, more effective ways should be found to:

- Reduce the overall level of waste generated;
- Increase the quantities of waste separated at source;
- Improve the collection infrastructure for waste separation;
- Provide convenient recycling facilities;
- Increase the range of waste types that can be recycled;
- Improve ways to raise awareness and promotion of recycling;
- Build the capacity of those who are already committed to become effective “change agents” to influence others who are not yet recycling to do so; and
- Work out the most appropriate financial incentives to increase recycling and create a structure where all the present stakeholders see the long-term benefit.

Appendix I Characteristics of the Estates Surveyed

1.1 Wonderland Villas

Situated on top of a range of hills overlooking Kwai Chung, the estate is one of Hong Kong's earliest estates to implement green initiatives dating back as far as 1986. It comprises 1,502 units, each with an area of 1,000 ft². The estate has 22 residential blocks with an average of 20 floors each, a clubhouse with swimming pool, a commercial center that includes a supermarket, and two multi-story car parks. The majority of the respondents are between 30-49 years old and there are equal numbers of those who have secondary and tertiary education.



Figure 6.
General Images of Wonderland Villas

1.2 Le Sommet

The luxury estate in the heart of urban Fortress Hill opened late 2000 and is small in size. It comprises a total of 394 units of between 750 and 2,200 ft² each, distributed over two residential blocks of 50 and 48 floors, with an average of 4 units per floor. The blocks were constructed above a podium that encompasses a swimming pool and clubhouse above four levels of car parking. The resident population is well educated as most of them are university graduates with a good portion having post-graduate qualifications as well. The households mostly comprise young couples in their 20's and 30's, many of whom have children. An Owner's Committee has recently been set up and the first green-themed carnival was held for teenagers during the summer holidays in August 2001.

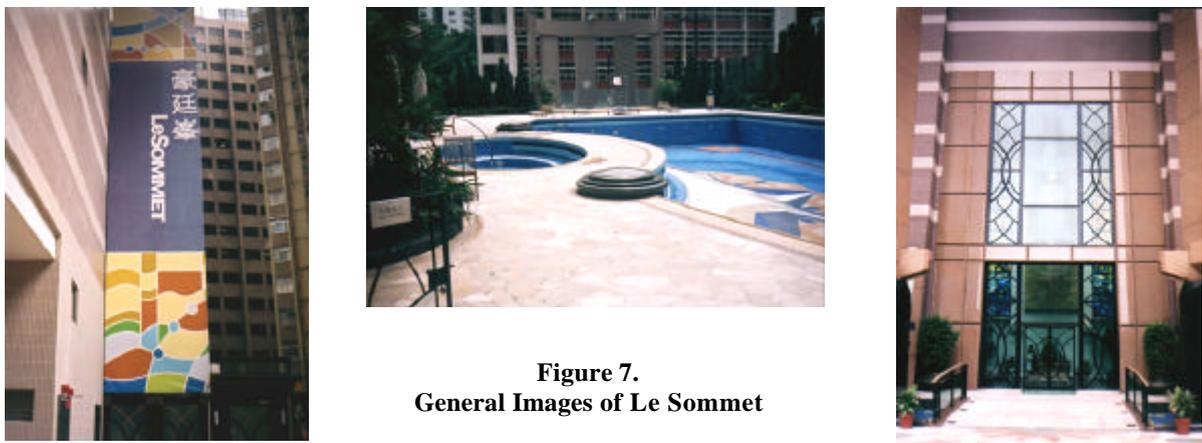


Figure 7.
General Images of Le Sommet

1.3 San Wai Court

San Wai Court is located within the suburban northeastern section of Tuen Muen New Town. It is a 6-block public housing estate built by the Hong Kong Housing Authority in 1989 with 35 floors each. Landscaped garden areas surround the blocks and there is a tennis court above a covered car park. In June 2000, HYH took over the management of the 2,100 units with their 8,400 residents. The population encompasses all ages including many families with children. Education levels are mainly secondary and primary and there is a strong Owners Incorporation Committee.



Figure 8.
General Images of San Wai Court

Appendix II Existing Waste Collection & Handling

2.1 Wonderland Villas

Residents place rubbish at the rear staircase in tied, biodegradable bags. The cleaning contractor, Nixon Cleaning Company, collects the bags at night from 22.00 (Maximum 2 Hours) and delivers by the normal lift to ground floor (only Block 8 has a service lift). A small truck collects the waste and transports it to the Refuse Room where it is placed in 660litre skips. The refuse is held over night and then ~30 skips of refuse are packaged and delivered early morning by Nixon on a daily basis by truck to a landfill. The residents themselves are encouraged to place bulky items in the Refuse Room and a Government contractor collects large waste on Saturdays.

2.2 Le Sommet

Residents place rubbish in tied, biodegradable plastic bags inside small plastic rubbish bins that are situated on each floor within the staircase. The cleaning contractor, Nixon, collects bags at night from 21.30 (Maximum 2 hours) with a second collection when necessary at 08.00. The refuse is placed in the service lift and delivered directly to rubbish skips on the Ground Floor. Between 10.30 and 11.00 the Government collects the refuse from ~12 skips. During the ongoing construction work within the units a significant quantity of building/demolition waste has been generated. Within the Refuse Collection Point there is a special temporary compound for residents to place such waste. As yet there are no discarded bulky items as people are still moving in. In the future when the residents have old furniture, the cleaning contractor will ask a separate contractor to collect the waste twice per month.



Figure 9.
Residents drop in stairwell
at Wonderland Villas



Figure 10.
General rubbish bin in
stairwell at Le Sommet

2.3 San Wai Court

Residents place rubbish in general plastic bags inside small plastic rubbish bins that are situated on each floor within the staircase. Luen Fat Cleaning Company collects the bags from 20.30–22.00 at night and deposits them into a rubbish shoot that is situated within a small room on each floor near the lift. The rubbish bags are collected from the shoot that is located within the Refuse Room on the Ground Floor. All the bags are collected from the shoot and moved by hand to skips where they are held over night. In the morning the cleaning company contractor moves the skips from each block to a central outdoor location, with good vehicular access, for collection between 10.00 and 11.00 by a government contractor. The residents themselves are encouraged to place bulky items, such as furniture, in a designated quiet outdoor location for collection by a specialist contractor. The removal of decoration waste is the individual responsibility of the residents who must pay an outside contractor.



Figure 11.
Rubbish shoot on each
floor at San Wai Court



Figure 12.
Rubbish shoot in Ground Floor
Refuse Room at San Wai Court

Appendix III Existing Waste Separation at Source

3.1 Wonderland Villas

At present, there are 6 sets of recycling containers to facilitate the collection of paper, aluminum cans and plastic bottles for 22 apartment blocks (1,502 units) that are supplied by the government. They are located at the internal vehicular road outside the blocks. Each block lobby has a further two cotton bags held in a metal frame for the collection of newspaper. Some households put paper outside their individual units for collection by the cleaning company. The recyclables are placed by the cleaning company in large containers in the Refuse Room and then sold directly to an individual recycling contractor. Large sheets of corrugated cardboard are flattened and placed in a separate area of the refuse room for collection. On an annual basis the residents place their old clothes in plastic bags within the lobby for delivery to the charity, the Salvation Army.

The “Wonderland Villas Newsletter” is an attractive and colorful 8-page document that includes information on recycling and informs the residents of the latest awards etc. All households with computer access can join the Hong Yip Internet service superhome.net. Each block has a lobby information board full of environmental information.



Figure 13.
Waste Recycling Cups in
Clubhouse at Wonderland Villas



Figure 14.
Paper collection bags in Lobby at
Wonderland Villas

3.2 Le Sommet

At present, residents are encouraged to place material for recycling in separate bags in the stairwell outside their units. Nixon Company, the cleaning company, collects and places the material in the Refuse Collection Point for collection. An outside contractor collects newspaper and cans, whereas another contractor collects plastic bottles. At present both contractors arrive on request between 8 to 10 times per month. Since the undertaking of this survey the estate manager has now installed 4 sets of 3 containers (mixed paper / aluminum cans / plastic bottles) provided by the government.

Information to encourage recycling is posted on the HYH internal Intranet service superhome.net and on an information board within the clubhouse.

3.3 San Wai Court

The estate manager installed 6 sets of 3 Containers (mixed paper / aluminum cans / plastic bottles) that were supplied by the Housing Department in June 2001 as part of the Waste Recycling Campaign. On a monthly basis HYH receives quantity figures from 3 separate collection companies. The estate manager has also actively encouraged the “re-collection” of used clothes, books and empty print cartridges on a regular basis.

The estate manager has provided information sheets that are placed in the lobby of the housing blocks to encourage the residents to use the recycling facilities that are available.



Figure 15.
Recycling Containers along
Internal Road at Wonderland Villas



Figure 16.
Cardboard Recycling at
San Wai Court

Appendix IV Waste Composition Survey Results

Table 1.
Location and Date of Waste Composition Surveys

Location	Survey	Date
Wonderland Villas	Weekend Day Survey	16 July 2001
	Weekday Survey	18 July 2001
Le Sommet	Weekend Day Survey	16 July 2001
	Weekday Survey	18 July 2001
San Wai Court	Weekend Day Survey	3 October 2001
	Weekday Survey	27 September 2001

Table 2.
Summary of findings from Waste Composition Survey

WASTE TYPE	WV1	LS1	SW3	WV2	LS2	SW2
EXISTING SOURCE SEPARATION						
1. Aluminum Cans	1.59	0.41	0.26	0.05	0.42	0.69
2. Plastic PET Bottles	0.44	0.14	0.78	0.34	0.28	1.52
3A. Newspaper	18.04	13.39	11.98	9.51	19.95	18.07
3B. High-grade Paper / Magazines	0.44	10.93	6.12	0.87	13.06	3.01
3C. Cardboard	1.42	1.09	2.47	2.45	2.95	3.55
3D. General (Tissue Paper)			11.08	3.12		0.55
NO EXISTING SEPARATION						
4.A. LDPE Low Density Polyethylene	16.27	21.31	12.24	8.62	10.82	10.34
4.B. HDPE High Density Polyethylene	1.24	0.14	0.91	1.63	1.26	1.38
5. Other Household Plastic	2.03	3.01	0.91	X	2.81	0.69
6. Styrofoam	2.56	X	0.52	0.96	1.12	0.55
7. Glass	3.71	0.96	0.91	2.31	2.95	0.69
8. Food	41.56	47.80	45.05	58.42	38.34	54.33
9. Household Batteries	X	X	0.13	0.05	0.14	0.14
10. Computer Ink Cartridges	X	X	X	X	X	X
11. Textiles	0.71	X	0.52	X	0.14	1.66
12. Ferrous Metal – Tin Cans	0.62	0.82	0.65	0.78	0.98	1.66
13. Other Types						
- Hello Kitty Bag, Diapers, Yard Waste				5.65		
- Clothes	1.59			0.43	2.11	
- Shoes	7.78			4.81		
- Camera / Glasses Case etc.					2.67	
- Football						0.69
- Wood						0.28
- Lantern Festival Coconuts			3.13			
- Lantern Festival Candle Tray			2.34			
TOTAL	100	100	100	100	100	100

- Notes:
1. All figures are percentages of Total Weight within one typical skip.
 2. There is no major difference between the "size" (i.e. number of pages of a newspaper) in Hong Kong between a weekend and weekday.
 3. Due to the heterogeneous nature of solid waste, the composition is difficult to determine statistically. For this reason, generalized standard survey procedures were adopted, although there is still the possibility of a "one-off" situation for a certain waste type caused by the random sampling techniques.

Table 3.
Potential quantity and revenue generated from existing source-separated waste types found in general waste if recycled.

Waste Type	Avg. Qty per Skip (kg)	Skips per day			X 30 days = M.tonnes per month	X 12 months = M.tonnes per year	HK\$ per year
		30 s/p/d	15 s/p/d	40 s/p/d			
Newspaper							
<i>Material value HK\$450 per metric tonne</i>							
WV Newspaper	10.05	301.5			9.05	108.54	48,843.00
LS Newspaper	12.00		180.0		5.40	64.80	29,160.00
SW Newspaper	11.15			446.0	13.38	160.56	1,927.00
Aluminum Cans							
<i>Material value HK\$5,000.00 per metric tonne</i>							
WV Alu. Cans	0.48kg	14.4			0.43	5.16	25,800.00
LS Alu. Cans	0.30kg		4.5		0.14	1.68	8,400.00
SW Alu. Cans	0.35kg			14.0	0.42	5.04	25,200.00
PET Bottles							
<i>Material Value HK\$1,600.00 per metric tonne</i>							
WV PET Bottles	0.30Kg	9.0			0.27	3.24	5,184.00
LS PET Bottles	0.15Kg		2.25		0.07	0.84	1,344.00
SW PET Bottles	0.85Kg			34.0	1.02	12.24	19,584.00

Notes: WV= Wonderland Villas, LS- Le Sommet, SW=San Wai Court.

Appendix V Household Survey and Survey Results

HOUSEHOLD SURVEY

Hong Yip is collaborating with Civic Exchange to explore how waste can be better managed at this estate. We would appreciate that the appropriate person from your household completes this survey. By returning the questionnaire within 7 days, you will be given a souvenir sponsored by the cleaning co. Nixon.

1.	Where do you deposit your waste for collection?			
	Outside your unit	Ground level waste collection area		
2.	How often do you place your waste outside for collection?			
	Everyday	Twice a week	Weekly	Other
3.	Do you separate any of the following waste types for recycling?			
	Paper	Yes	No	
	Plastic Bottles	Yes	No	
	Aluminum Cans	Yes	No	
	Other	Yes	No	Type _____
4.	If you ticked yes to any of the types in Question 3, where do you take the waste for recycling?			
	Outside your unit	Ground Level	Off the estate	
5.	If you ticked no to all of the types in Question 3, would you be prepared to recycle if there was a collection point?			
	Outside your unit	Ground Level	Off the estate	
6.	If you ticked no to some of the types in Question 3, can you state the reason(s) why?			
	Don' t know how to recycle	Not enough time		
	No financial incentive	Don' t consider produce enough recyclables		
	Not enough space	Not prepared to recycle		
	Not convenient enough	Not aware of recycling in estate		
	Other _____			
7.	Do you think recycling is important?			
	Yes	No		
8.	If you ticked yes to Question 7, can you state the reason(s) why			
	beneficial to the environment	Yes	No	
	beneficial to the community	Yes	No	
	supports the economy	Yes	No	
	Other _____			

9. If you do recycle, where did you learn to do it?
 School Government Other _____

10. The following waste items can also be recycled, if there was a recycling unit for these inside the estate, which would you recycle?

Glass	Yes	No
Computer Ink Cartridges	Yes	No
Batteries	Yes	No
Clothes	Yes	No
Computers & electronic goods	Yes	No
Food Waste	Yes	No

11. If there was an estate carnival

Would you give second hand items to charity?	Yes	No
Would you buy second hand items for yourself?	Yes	No
Would you sell second hand items for profit?	Yes	No

12. If there were an environmental group in the estate would you be interested in joining?

Yes No

13. Any further comments _____

14. Would you like to learn more? Yes No

Particulars

GENDER	Male	Female		
AGE	18-29	30-49	50-69	70+
EDUCATION	Primary	Secondary	Graduate	Post Graduate
HOUSEHOLD SIZE	No of adults (18+)		How many working?	
	No of children			

Table 4.
Questionnaire Results – Wonderland Villas

No.	Question	Choice	Results	%
1.	Where do you deposit your waste for collection?	Outside your unit	150	79.79
		Ground level waste collection area	38 (24)	20.21

No.	Question	Choice	Results	%
2	How often do you place your waste outside for collection?	Everyday	144	76.60
		Twice a week	7	3.72
		Weekly	18	9.57
		Other	14	7.45
		Every other day	(1)	
		No answer	5	2.66

No.	Question	Choice	Results			
3.	Do you separate any of the following waste types for recycling?		Yes	No	No Answer	
		Paper	169 (89.89%)	19 (10.11%)	-	
		Aluminum Cans	113 (60.11%)	68 (36.17%)	7 (3.72%)	
		Plastic Bottles	111 (59.04%)	70 (37.24%)	7 (3.72%)	
		Other	31 (16.49%)	66 (35.11%)	91 (48.40%)	
		Other				
		Glass	(11)			
		Compost, skin of bananas as fertilizer	(1)			
		Clothes / Shoes	(3)			
		Household Waste	(1)			
		Batteries	(1)			
		Paper Bags	(1)			
		Plastic Bags	(2)			
		Newspaper	(1)			
Styrofoam	(1)					
Tin Cans	(2)					
Non-specific	(7)					

No.	Question	Choice	Results	
4.	If you ticked no to all (or some) of the types in Question 3, would you be prepared to recycle if there was a collection point?	Outside your unit	Yes 94 (90.38%)	No 10 (9.62%)

No.	Question	Choice	Results	%
5.	If you ticked no to some of the types in Question 3, can you state the reason(s) why?	Don't know how to recycle	26	15.57
		No financial incentive	3	1.80
		Not enough space	27	16.17
		Not convenient enough	65	38.92
		Not enough time	14	8.38
		Don't consider produce enough recyclables	2	1.20
		Not prepared to recycle	4	2.40
		Not aware of recycling in estate	8	4.79
		Others	18	10.78
		Other		
No recycling box for the particular type of waste			(3)	
Do not use much plastic bottles and aluminum cans			(5)	
Do not know where the collection box is.			(2)	
Do not know what can be recycled besides papers, aluminum cans and plastic bottles.			(2)	
Will only place it outside unit				
Maids do not separate waste. Usually waste plastic bags. But will put recyclable waste in the collection box inside building.				
It is more convenient to place collection box in lift lobby.				
Inconvenient to take plastic bottles to collection box on ground because of its size and it is dirty.				
No recycling for the particular types of wastes.				
Too much effort to clean plastic bottles and aluminum cans.				

No.	Question	Choice	Results	No Answer	
6.	Do you think recycling is important?	Yes / No	Yes 186 (98.94%)	No 2 (1.06%)	No Answer -

No.	Question	Choice	Results	No Answer	
7.	If you ticked yes to Question. 6 can you tell us the reason(s) why?	Beneficial to the environment	182 (97.85%)	-	4 (2.15%)
		Beneficial to the community	135 (72.58%)	3 (1.61%)	48 (25.81%)
		Supports the economy	85 (45.70%)	13 (6.99%)	88 (47.31%)
		Other	12		
		Should not waste resources	(5)		
	Education	(2)			
	Civil responsibilities	(3)			
	Habit				
	Should reuse material so do not end up in landfill				

No.	Question	Choice	Results	%		
8.	If you do recycle, where did you learn to do it?	School	48	20.43		
		Government	118	50.21		
		Other	69	29.36		
		Other				
		Media	50			
		Environmental Group	2			
		Common Knowledge	3			
		Own Estate	5			
		Community	2			
		At work	4			
Friends	1					
Self Motivation	2					

No.	Question	Choice	Results		
9.	The following waste items can also be recycled, if there was a recycling unit for these inside the estate, which would you recycle?	Yes	Yes	No	No Answer
		Glass	157 (83.51%)	20 (10.64%)	11 (5.85%)
		Computer Ink Cartridges	130 (69.15%)	28 (14.89%)	30 (15.96%)
		Batteries	148 (78.72%)	20 (10.64%)	20 (10.64%)
		Clothes	163 (86.70%)	13 (6.91%)	12 (6.38%)
		Computer & Electronic goods	146 (77.66%)	19 (10.11%)	23 (12.23%)
		Food Waste	76 (40.43%)	79 (42.02%)	33 (17.55%)
	Other				
	Only if collection box outside unit				

No.	Question	Choice	Results		
10.	When there was an estate carnival	Would you give second hand items to charity?	154 (81.91%)	9 (4.79%)	25 (13.30%)
		Would you buy second hand items for yourself?	64 (34.04%)	103 (54.79%)	21 (11.17%)
		Would you sell second hand items for profit?	45 (23.94%)	118 (62.77%)	25 (13.30%)

No.	Question	Choice	Results		
11.	If there were an environmental group in the estate would you be interested in joining?	Yes / No	Yes 86 (45.74%)	No 86 (45.74%)	No Answer 16 (8.52%)

No.	Question	Results
12.	Other Comments?	27
	Should recycle glass	2
	Should recycle batteries	1
	There should be more collection boxes for different types of things	
	There should be a collection box for clothes	2
	Should place collection boxes in a convenient location	3
	Should reduce advertising pamphlets for each flat, one in the lobby is enough.	
	Should continue promoting (the benefits) of recycling	5
	Should place collection boxes on each floor/block	4
	Will only join environmental activities if there is time	2
	Can actively ask Philippine maids to participate	
	Return profit from recycling back into funds of the Estate	
	Want to be a role model	
	Should recycle plastic bags	
	Should separate different types of paper that can be recycled	
	Some people just leave the newspaper and garbage by the stairs, not inside the bins	

No.	Question	Choice	Results		
13.	Would you like to learn more?	Yes / No	Yes 119 (63.30%)	No 30 (15.96%)	No Answer 39 (20.74%)

Table 5.
Respondent Information – Wonderland Villas

Gender	No
Male	77
Female	105

Age	No
<18	3
18-29	18
30-49	131
50-69	31
70+	1

Education	No
Primary	9
Secondary	70
Graduate	70
Post Graduate	32

HouseholdSize	1	2	3	4	5	6
No. of adults	7	92	47	19	5	2
No. of children	38	52	5			
How many working?	56	64	17	2		

Table 6.
Questionnaire Results - Le Sommet

No.	Question	Choice	Results	%
1.	Where do you deposit your waste for collection?	Outside your unit	107	98.16
		Ground level waste collection area	1	0.92
		Don' t know	1	0.92

No.	Question	Choice	Results	%
2	How often do you place your waste outside for collection?	Everyday	93	85.32
		Twice a week	11	10.10
		Weekly	2	1.83
		Other	3	2.75
		Many times a day	(1)	

No.	Question	Choice	Results			
3.	Do you separate any of the following waste types for recycling?		Yes	No	No Answer	
		Paper	40 (36.70%)	67 (61.47%)	2 (1.84%)	
		Aluminum Cans	17 (15.60%)	87 (79.82%)	4 (3.67%)	
		Plastic Bottles	17 (15.60%)	88 (80.73%)	3 (2.75%)	
		Other	6 (5.50%)	69 (63.30%)	33 (30.28%)	
		Other				
		Glass	(2)			
Batteries	(1)					
Tin Cans	(1)					
Non-Specific	(2)					

No.	Question	Choice	Results	%
4.	If you ticked yes to any of the types in Question 3, where do you take the waste for recycling?	Outside your unit	43	84.32
		Ground Level	4	7.84
		Off Estate	4	7.84

No.	Question	Choice	Results	%
5.	If you ticked no to some of the types in Question 3, would you be prepared to recycle if there was a collection point?	Outside your unit	58	67.44
		Ground Level	25	29.07
		Off Estate	3	3.49

No.	Question	Choice	Results	%	
6.	If you ticked no to some of the types in Question 3, can you state the reasons why	Don' t know how to recycle	37	24.67	
		No financial incentive	-	-	
		Not enough space	20	13.33	
		Not convenient enough	17	11.33	
		Not enough time	6	4.00	
		Don' t consider produce enough recyclables	2	1.33	
		Not prepared to recycle	4	2.67	
		Not aware of recycling in estate	64	42.67	
		Other			
		No provision of recycling box			
No newspaper recycling					
Do not create paper waste					
If there is a recycling container then I will use it					
Philippine maid does not understand					
Already asked maid to separate but not sure if done yet, will do own separation of books & magazines					
No collection points in building					

No.	Question	Choice	Results		
7.	Do you think recycling is important?	Yes / No	Yes 109 (100%)	No -	No Answer -

No.	Question	Choice	Results		
8.	If you ticked yes to Question. 7 can you tell us the reason(s) why?	Beneficial to the environment	107 (98.17)	-	2 (1.83%)
		Beneficial to the community	92 (84.40%)	-	17 (15.60%)
		Supports the economy	63 (57.80)	11 (10.09%)	35 (32.11%)
		Other Education Care about and family so that is why there is a responsibility to recycle Environmental protection is important for good karma So we don't waste resources Better utilization of natural resources	7 (3)		

No.	Question	Choice	Results	%
9.	If you do recycle, where did you learn to do it?	School	14	13.33
		Government	51	48.57
		Other	40	38.10
		Other Another Country Media Community Study Knowledge Office Books As member of the earth	(20) (14)	

No.	Question	Choice	Results		
10.	The following waste items can also be recycled, if there was a recycling unit for these inside the estate, which would you recycle?	Glass	83 (76.15%)	3 (2.75%)	23 (21.10%)
		Computer Ink Cartridges	46 (42.20%)	16 (14.68%)	48 (44.04%)
		Batteries	72 (66.06%)	11 (10.09%)	26 (23.85%)
		Clothes	84 (77.06%)	6 (5.50%)	19 (17.43%)
		Computer & Electronic goods	64 (58.72%)	7 (6.42%)	38 (34.86%)
		Food Waste	42 (38.53%)	22 (20.18%)	45 (41.28%)
		Other Cardboard and Plastic Bottles			

No.	Question	Choice	Results			
11.	When there was an estate carnival	Would you give second hand items to charity?	96 (88.07%)	11 (10.09%)	-	2 (1.83%)
		Would you buy second hand items for yourself?	35 (32.11%)	66 (60.55%)	1 (0.92%)	7 (6.42%)
		Would you sell second hand items for profit?	26 (23.85%)	74 (67.89%)	1 (0.92%)	8 (7.34%)
		(1 Household specified – VCD, CD, Software)				

No.	Question	Choice	Results			
12.	If there were an environmental group in the estate would you be interested in joining?	Yes / No	Yes 41 (37.61%)	No 62 (56.88%)	Maybe 2 (1.83%)	No Answer 4 (3.67%)

No.	Question	Results
13.	Other Comments?	15
	<p>We support recycling and environmentally friendly activity.</p> <p>If the apartment can provide sufficient and effective guidelines and facilities in recycling and environmental friendly issues, my family will follow for sure.</p> <p>Puts newspaper next to rubbish bin but placed back in bag.</p> <p>Must encourage children to participate.</p> <p>They should at least place bins for plastic bottles, bags, aluminum cans and paper immediately.</p> <p>Estate managers should promote env protection and set rules and conditions so people can join in.</p> <p>Hopes there will be plastic bottle, paper, glass & plastic bags.</p> <p>Not in support of carnival as difficult to control who will come.</p> <p>Should have collection points on ground floor for clothes, plastic, aluminum & paper.</p> <p>Square bins should replace circular bins as hard to put top on securely.</p> <p>Recycling only one part env issue, more important to keep building clean.</p> <p>Hopes there will be collection soon.</p> <p>Difficult to promote as Phil maids do not know about env But they are prepared to try.</p> <p>Use to separate but stopped as realized all trash went in together</p>	

No.	Question	Choice	Results		
14.	Would you like to learn more?	Yes / No	Yes 68 (62.39%)	No 31 (28.44%)	No Answer 10 (9.17%)

Table 7.
Respondent Information – Le Sommet

Gender	No
Male	53
Female	56

Age	No
18-29	17
30-49	74
50-69	17
70+	1

Education	No
Primary	-
Secondary	27
Graduate	48
Post Graduate	34

Household Size	1	2	3	4	5
No. of adults	13	49	28	16	2
No. of children	37	53	8	2	
How many working?	15	25	1		

Table 8.
Questionnaire Results – San Wai Court

No.	Question	Choice	Results	%	
1.	Where do you deposit your waste for collection?	Outside your unit	32	47.06	
		Ground level waste collection area	36	52.94	
No.	Question	Choice	Results	%	
2	How often do you place your waste outside for collection?	Everyday	30	44.12	
		Twice a week	15	22.06	
		Weekly	14	20.59	
		Other	9	13.24	
No.	Question	Choice	Results	%	
3.	Do you separate any of the following waste types for recycling?		Yes	No	No Answer
		Paper	61 (89.71%)	7 (10.29%)	-
		Aluminum Cans	53 (77.94%)	12 (17.65%)	3 (4.41%)
		Plastic Bottles	50 (73.53%)	12 (17.65%)	6 (8.82%)
		Other	18 (26.47%)	15 (22.06%)	35 (51.47%)
	Other				
No.	Question	Choice	Results	%	
4.	If you ticked yes to any of the types in Question 3, where do you take the waste for recycling?	Outside your unit	17	25.75	
		Ground Level	33	50.00	
		Off Estate	16	24.25	
No.	Question	Choice	Results	%	
5.	If you ticked no to some of the types in Question 3, would you be prepared to recycle if there was a collection point?	Outside your unit	12	27.27	
		Ground Level	18	40.91	
		Off Estate	14	31.82	
No.	Question	Choice	Results	%	
6.	If you ticked no to some of the types in Question 3, can you state the reasons why	Don' t know how to recycle	17	22.37	
		No financial incentive	11	14.47	
		Not enough space	14	18.42	
		Not convenient enough	19	25.00	
		Not enough time	4	5.26	
		Don' t consider produce enough recyclables	5	6.58	
		Not prepared to recycle	4	5.26	
		Not aware of recycling in estate	2	2.63	
	Others				
	No provision of recycling box				
	No newspaper recycling				
	Do not create paper waste				
	If there is a recycling container then I will use it				
	Philippine maid does not understand				
	Already asked maid to separate but not sure if done yet, will do own separation of books & magazines				
	No collection points in building				
No.	Question	Choice	Results	%	
7.	Do you think recycling is important?	Yes / No	Yes	No	N/A
			67 (98.53%)	-	1 (1.47%)

No.	Question	Choice	Results		
8.	If you ticked yes to Question. 7 can you tell us the reason(s) why?	Beneficial to the environment	Yes 65 (95.59%)	No -	N/A 3 (4.41%)
		Beneficial to the community	53 (77.94%)	3 (4.41%)	11 (16.17%)
		Supports the economy	46 (67.65%)	3 (4.41%)	19 (27.94%)
		OTHERS			

No.	Question	Choice	Results	%
9.	If you do recycle, where did you learn to do it?	School	14	20.29
		Government	43	62.32
		Media	10	14.49
		Other	2	2.90
		Other		

No.	Question	Choice	Results		
10.	The following waste items can also be recycled, if there was a recycling unit for these inside the estate, which would you recycle?	Glass	Yes 33 (48.53%)	No 13 (19.12%)	No Answer 22 (32.35%)
		Computer Ink Cartridges	29 (42.65%)	15 (22.02%)	24 (35.29%)
		Batteries	32 (47.06%)	12(17.65%)	24 (36.29%)
		Clothes	58 (85.29%)	2 (2.94%)	8 (11.76%)
		Computer & Electronic goods	53 (77.94%)	8 (11.76%)	2 (2.94%)
		Food Waste	23 (33.82%)	16 (23.53.%)	29 (42.65%)
		Other			

No.	Question	Choice	Results		
11.	When there was an estate carnival	Would you give second hand items to charity?	Yes 51 (73.02%)	No 10 (15.87.%)	No Answer 7 (11.11%)
		Would you buy second hand items for yourself?	31 (44.44%)	29 (42.86%)	8 (12.70%)
		Would you sell second hand items for profit?	25 (34.92%)	28 (41.27%)	15(23.81%)

No.	Question	Choice	Results		
12.	If there were an environmental group in the estate would you be interested in joining?	Yes / No	Yes 47 (69.12%)	No 20 (29.41%)	No Answer 1 (1.47%)

No.	Question	Results
13.	Other Comments?	3
	It is hoped that there will be permanent collection points for clothes and toys. Should set up uniforms and books collection points twice a year, which can also act as second-hand markets. Whether or not to participate in an env. group will depend on the necessity of organizing the activity, the nature of the activity and the his schedule.	

No.	Question	Choice	Results		
14.	Would you like to learn more?	Yes / No	Yes 45 (66.18%)	No 6 (8.82%)	No Answer 17 (25.00%)

Table 9.
Respondent Information – San Wai Court

Gender	No
Male	36
Female	32

Age	No
18-29	24
30-49	34
50-69	8
70+	2

Education	No
Primary	15
Secondary	47
Graduate	2
Post Graduate	2

Household Size	1	2	3	4	5	6
No. of adults	6	21	17	12	3	1
No. of children	16	10	7			
How many working?	19	26	8	3		