Chapter 6
Hong Kong Needs to Embrace a Holistic Approach to Waste Management

Edwin Che Feng Lau

Abstract Hong Kong's waste problems are challenging and have become increasingly intractable. The city relies on landfilling as its core approach to handling over 10,000 tonnes of municipal solid waste every day (2015 figure). Most of Hong Kong's recyclables were used to be exported to the mainland and other Asian cities. However, since early 2018, mainland authorities have tightened the regulations over imported wastes. As a consequence, an increasing volume of locally generated waste is now going into the landfills. The projected early saturation of the three strategic landfills has intensified the waste management problem in our land-scarce city. The chapter examines the crux of the waste problem from multiple perspectives, including the government's position, the business sector's approaches and the general public's individual behaviour. In order to cope with the waste problems successfully, there is a need to adopt a holistic waste management approach. Public education is an extremely challenging task that requires continuous investments to produce desirable results. However, such investments have proven to be seriously inadequate in Hong Kong. Although recycling bins have been put up in public places for over 20 years, non-recyclables and contaminated items are still often found in the recycling bins. Without an effective public education programme, the provision of hardware by itself will only yield a half-baked solution. To solve our city's waste problem, a fundamental change in people's mindset on waste is absolutely necessary. We need to strive for a zero-waste economy by treating waste as a resource, and we need to find a way to extend the lifespan of consumables rather than constantly replacing workable gadgets with trendy new products.

Keywords Holistic waste management · Recycling · Zero-waste economy · Producer responsibility

E. C. F. Lau (✉)
The Green Earth, Hong Kong SAR, China
e-mail: edwinlau@greenearth-hk.org

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6.1 An Overview

6.1.1 Current State of the Waste Problems

To most members of the public, waste management is merely a straightforward government task to remove refuse from our streets and rubbish bins. Most people don't even consider that they have responsibility for the trash they produce, let alone having to pay for the treatment of their waste according to the Polluter Pays Principle. In the 1960s–70s, our government probably held a similar view that it had the role of efficiently removing waste from our streets and burying it in places far from our living environment to prevent hygiene problems that are hazardous to public health. Hong Kong's municipal solid waste has increased by nearly 80% in the last three decades, while our population growth has only increased by 36% for the same period (Environment Bureau, 2013). This reflects extraordinarily high growth in waste disposal whereby the existing waste management facilities, not to mention government policies, have been unable to cope with over 10,000 tonnes of municipal solid waste (MSW) being dumped in our landfills every day (Environmental Protection Department, 2016b).

Hong Kong had several incineration plants in the past to treat our solid waste before disposal, but they had rather poor emissions standards that created hazardous air pollution problems, so the last one was closed in 1997. Today, the core measures to handle our MSW have become quite a single-focused solution—landfilling. Although the city's three strategic landfills started operation between 1993 and 1995, landfilling of untreated waste exerts heavy pressure on Hong Kong, which is a small city with scarce land for housing or its many other needs. Therefore, the government's plan for expanding the landfills to cope with our waste growth is an interim but not a sustainable solution. As the average per person MSW disposal rate has kept rising since 2006, from the lowest level of 1.27 kg in 2011 to reach 1.39 kg in 2015, unfortunately, the MSW recycling rate dropped to 35% in 2015 from a relatively higher level of 48% in 2011 (Environmental Protection Department, 2016a). That means Hong Kong has disposed of more waste, while less waste has been recycled in the last 10 years. The situation is somehow related to our affluent lifestyle and new modes of business operation coupled with changes in the import policies of mainland China.

The mainland has been for decades at the receiving end of recyclables generated in many western countries as well as Hong Kong, from used paper to metal to plastic. The mainland could absorb nearly all of Hong Kong's recyclables due to its strong development in the manufacturing industries. For instance, plastic and paper are the common packaging materials used to protect and pack products made in factories. And many products require plastics as their basic raw materials. However, in 2013, the Chinese government launched 'Operation Green Fence', a policy to tighten the import of recyclables into the mainland, as it did not want to continue being the trash dump for other countries. Therefore, only processed recyclables, especially plastics, that have been shredded and cleaned were accepted. Plastic scraps packed into cubes

without cleaning were rejected. Because of this policy change, the price of our waste plastics has dropped significantly, and some recyclers even stopped accepting local plastic scraps as they did not have the processing facilities. In February 2017, the mainland government launched another campaign called the 'National Sword 2017', aimed at further preventing unclean or illegal wastes from entering the mainland.

So, where will such unprocessed plastic scraps go? If they were not bought by buyers from other Asian cities, our landfills will probably be the destination. Although green groups have lobbied the government for years to implement more environmental policies, Hong Kong is yet to have relevant legislation that mandates producers to recycle their product packaging waste. In the case of used plastic bottles for beverages and personal care products, producers could continue making profits by selling their products, but need not be responsible for collecting their scrap plastic bottles in the community, while the taxpayers have no choice but to share the waste disposal costs.

6.1.2 Trends of Waste Disposal and Recycling

The waste disposal trend will be affected by several factors, such as lifestyle, business operation mode, public environmental awareness, product design, repair and reuse support, recycling facilities, etc. First, let us look at the long-term trend of waste disposal in Hong Kong.

Between 1997 and 2015, the highest per capita MSW daily disposal amount was 1.4 kg in 1999, 2000, 2002 and 2003, while the lowest per capita MSW daily disposal amount for the same period was 1.27 kg in 2011. This figure rose to 1.39 kg in 2015. Such waste disposal amounts showed a decline from 2006 for a couple of years but have then gradually increased again since 2011. To further consider the differences in domestic waste and commercial and industrial waste per capita daily disposal during the same period, there was a slight drop in domestic waste from 1.04 to 0.89 kg, a drop of 14.4%. However, the commercial and industrial waste increased from 0.29 to 0.51 kg, a rise of 75.9%. (Fig. 6.1).

Although the waste charging policy is not yet in place, people are more cautious about waste produced at home than in the workplace or public places, and therefore have put some efforts into reducing domestic waste by doing better waste recycling, reuse or avoidance. All public rental housing estates have installed the three-colour recycling bins since October 2005 to allow about 29% of the Hong Kong population to recycle their daily waste (Transport and Housing Bureau, 2015). The Hong Kong Housing Authority has also jointly launched a long-term community environmental programme named Green Delight in Estates with three green groups since mid-2005 to encourage its public rental housing residents to protect the environment with waste reduction as one of the main themes. The 11% drop in the per capita domestic waste disposal amount from 1 kg in 2005 to 0.89 in 2015 has somehow reflected the result of the continuous engagement with public housing residents.

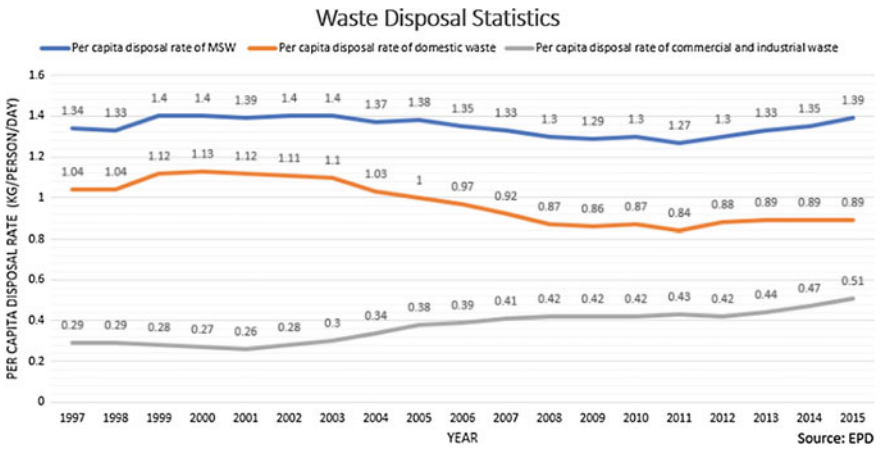

Fig. 6.1 Per capita disposal rate of MSW. *Data source* EPD

The rise in waste disposal in the commercial and industrial sector has triggered the government to consider policies and voluntary schemes to reverse the waste growing trend. But not much has been done in this sector except for the Food Wise Hong Kong Campaign that was launched in May 2013 to promote food waste reduction. The campaign has made some achievements after 2 years of work, as the food waste disposal amount recorded the first ever drop in 2015, a drop of 7.1%, from 3,640 tonnes/day in 2014 to 3,382 tonnes/day in 2015, while the bigger drop came from the domestic sector again.

As the first 200-tonne capacity organic waste treatment facility is still in the final stage of the building process, the city only has one large-scale commercial operator which runs a low-capacity food waste recycling plant at the government's EcoPark. As a result, most of the food waste generated in our city is dumped in landfills, so the food waste reduction result is probably due to the government campaign and the efforts of non-government organizations who are devoted to promoting food waste reduction and regularly collecting surplus food from restaurants and hotels.

Waste recycling has been operating as a commercial activity in Hong Kong for over 100 years (Heaver, 2017), while the government has kept its distance from this business, albeit realizing the waste reduction efforts that large-scale waste recycling companies and the many small street-level recycling shops have contributed.

Waste recyclers operate their businesses purely based on a revenue-driven motive, and therefore the more valuable the recyclables are, the more that will be recovered from the waste stream. In other words, recyclables with relatively low value will be left for the government to dispose of in our landfills. But even low-valued recyclables can be turned into useful raw materials to make new products. For example, used glass bottles have a very low market value, so recyclers do not bother to collect them, even if there are large numbers of them, for example at bars and hotels, but used glass bottles can be washed and cleaned for reuse, or they can be finely ground for use as a

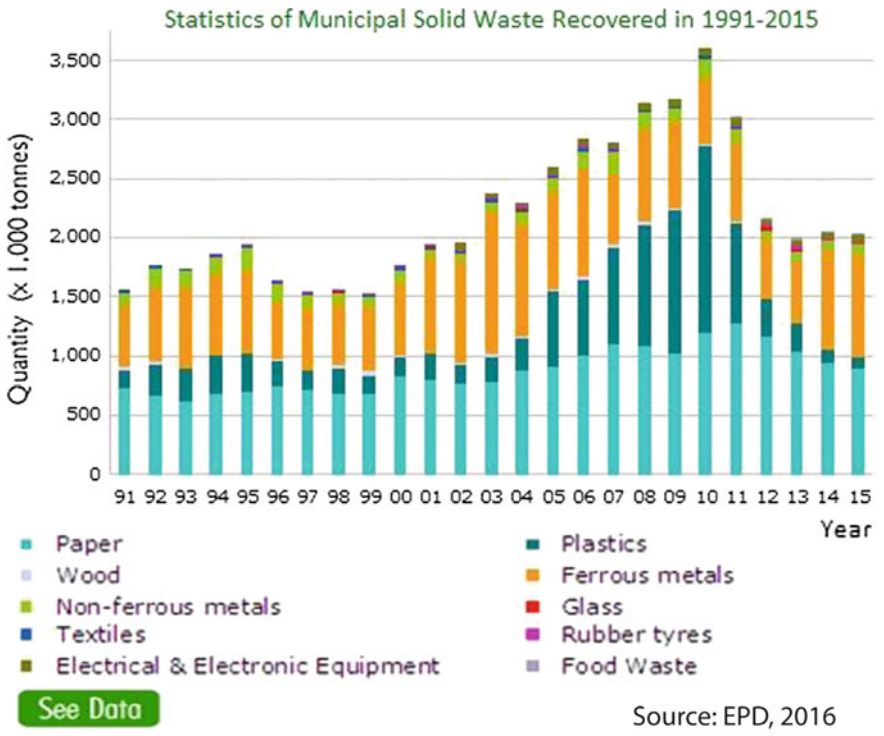

Fig. 6.2 Statistics of MSW recovered in 1991–2015 (EPD, 2016c)

construction material for building roads and buildings. Although the government is aware of the disposal of recyclables in landfills, it has not changed its policy mindset to create an artificial price for the low-valued recyclables as it is afraid that this will become a long-term financial burden on the government.

Paper, ferrous metals and plastics are the most common recyclables in Hong Kong. The recycling rate of paper was 52.1% and for metals, it was 91.7% in 2015. The recycling rate of plastics fluctuated most among the three types of recyclables from the early 90s to 2015. It reached a peak of 69% in 2010, with over 1.5 million tonnes being recycled, but this rate dropped to 10.5% in 2015, the lowest in the period, with only 93,900 tonnes recycled (Fig. 6.2). The drastic drop in the recycling rate for plastics could be attributed to the 'Operation Green Fence' policy launched by the Chinese government in 2013. The drop in plastic recycling started in 2014.

The world economy also affects the market value of recyclables. The world financial crisis of 2008 has slowed down the world economy and a deep recession has happened in many jurisdictions globally. In the same year, oil prices dropped from USD156 in June to USD45 in June 2017 (Macrotrends LLC, 2018). The price of virgin plastic materials also dropped accordingly; hence manufacturers in the mainland saw little incentive to buy recycled plastic materials, which has further affected the

price of scrap plastics in the second-hand market. When less plastics are recovered for recycling, more will end up in landfills. Government waste monitoring reports showed that in 2010, each day 1,941 tonnes of plastic were dumped in landfills; this amount increased to 2,183 tonnes per day in 2015, a rise of 12.5% in 5 years (Environmental Protection Department, 2011).

6.1.3 International Experiences

It is interesting to compare Hong Kong per capita domestic waste generation with other Asian cities due to their similar levels of development. Among the four Asian cities of Seoul, Tokyo, Taipei and Hong Kong, an average Tokyo person generates 0.77 kg of domestic waste, followed by Seoul (0.95 kg), followed by Taipei city (1 kg), with the highest level of 1.36 kg for Hong Kong (Environment Bureau, 2013).

It is not encouraging at all to make known to others that Hong Kong has earned the top rank in domestic waste generation. Over the years, the Legislative Council has more than once raised questions for the government about the continued rise in the city's MSW, and the government has responded by saying that due to the vast numbers of tourists visiting Hong Kong and the economic growth, the city's MSW is bound to increase (HKSAR Government, 2016). Is there a real relationship between the number of tourists, the economic growth and the MSW amount? The following graphs (Figs. 6.3 and 6.4) show the two sets of figures and give us an idea that they do not have any correlation. In other words, more tourists visiting Hong Kong or the city's economic growth do not necessarily generate more daily per capita MSW. Comparing the similar data of other cities with similar economic development levels, it is interesting to note that their MSW amount also did not show any correlation with the numbers of visitors or their economic growth (Figs. 6.5 and 6.6).

6.2 Government Measures and Their Effectiveness

6.2.1 Evolution of Government Measures: Late 1980s–2010s

The Environmental Protection Department was set up in 1986 and it released its first policy paper named 'White Paper: Pollution in Hong Kong: A time to act' on World Environment Day 1989, which set out its vision and direction for tackling Hong Kong's pollution problems (Environmental Protection Department, 1989). Regarding the topic of waste, its direction for the following 10 years from 1986 was to build bigger landfills with higher environmental standards and to close the incinerators that were operating with rather poor emission standards. It did not spell out any immediate plans for the government to address waste avoidance or recycling as it considered that direct participation in waste recovery and recycling was inappropriate

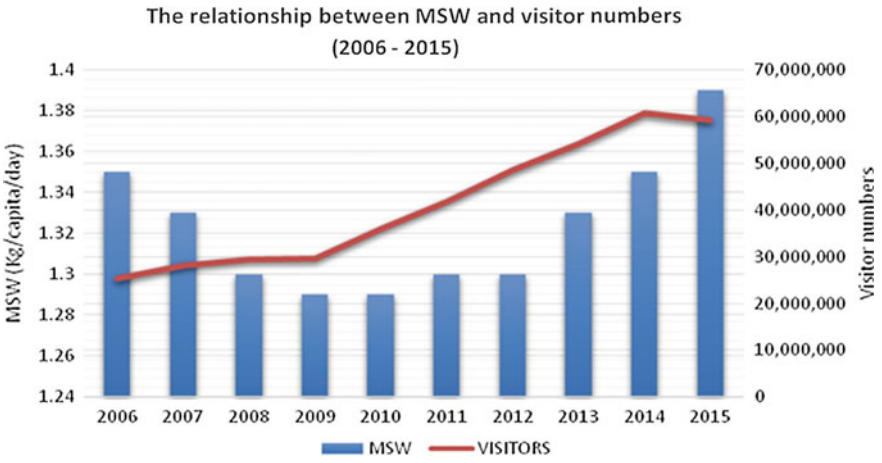

Fig. 6.3 Hong Kong visitor data: Zhong (2016), Hong Kong MSW data from EPD (2016)

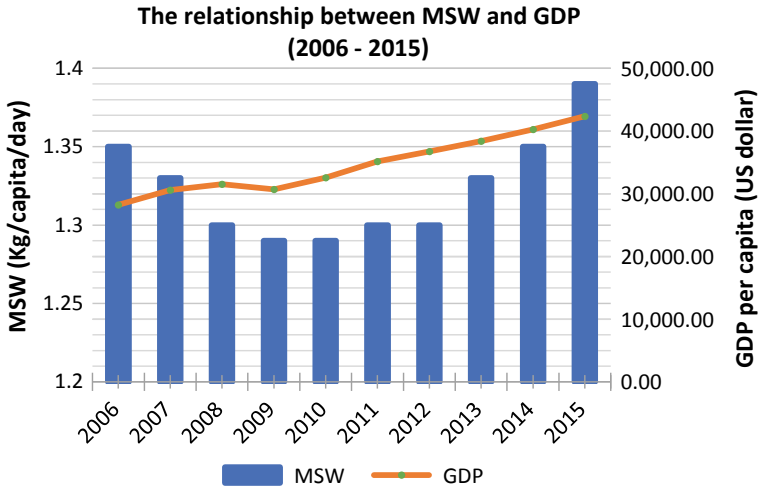

Fig. 6.4 MSW data from EPD (2016). GDP data from The World Bank (2015), Hong Kong Census and Statistics Department (2018)

for the government. However, it claimed that it would explore measures to limit waste generation and encourage recycling. This reflected that the waste management direction in that era focused mainly on one end-of-pipe solution instead of on multiple solutions, even if they were all end-of-pipe solutions. Moreover, the government did not see that it could also play a role in helping Hong Kong preserve our land and achieve more economic gains by recovering recyclables from the waste stream. It is considered that the government mindset of that era was quite narrow and short-sighted.

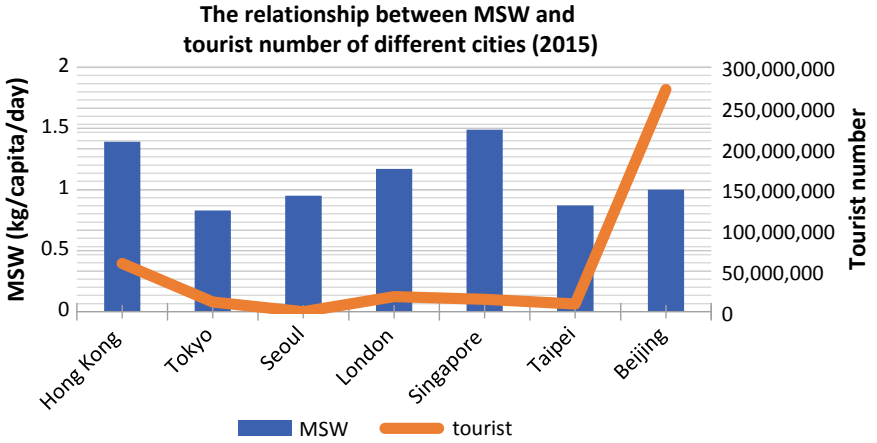

Fig. 6.5 MSW data from EPD (2016), Environmental Protection Bureau, Macao (2017), London Data Store (2016), Clean Authority of Tokyo (2016), Anonymous (2015), Nate (2018). Visitor data of Beijing from Zhong (2016), Tokyo Metropolitan Government (2017), Won (2017), London & Partners (n.d.), Greater London Authority (2015), Singapore Tourism Board (2016), Department of Information and Tourism, Taipei City Government (2016)

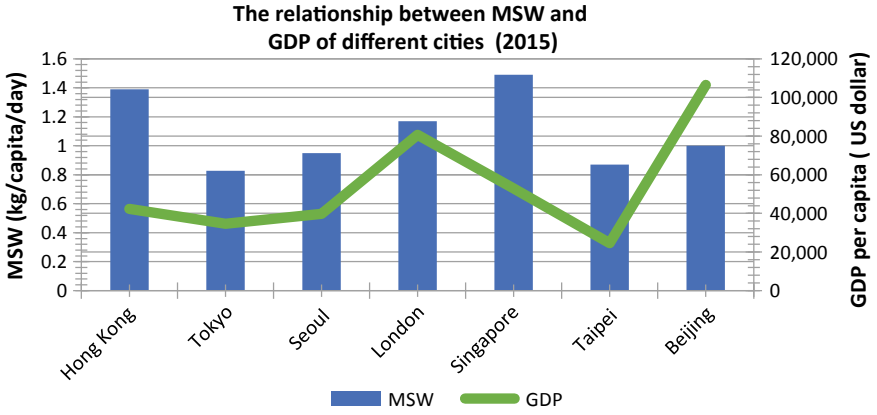

Fig. 6.6 MSW data of different cities from EPD (2016), Statistics Division, Bureau of General Affairs, Tokyo Metropolitan Government, Clean Authority of Tokyo (2016), Anonymous (2015), Nate (2018). GDP data of different cities from The World Bank (2015), Hong Kong Census and Statistics Department (2018), Greater London Authority (2015), Trading Economics (2018), Worldometers (2018), kuaiyilicai (2015). Wikipedia (2017), Read 01 (2016), Beijing Municipal Bureau of Statistics (2016)

Around a year after the handover of Hong Kong to the Chinese government, the Waste Reduction Framework Plan (1998–2007) as the first 10-year plan tackling waste problems, was developed by the Hong Kong SAR government. This plan emphasized that reform of the current institutional arrangements and operational practices could save resources and help promote waste reduction. The objectives of the plan included aspects such as minimization of waste that needs disposal, increases in the waste recycling rate, and conservation of the earth's non-renewable resources. It was quite a breakthrough in the government mindset regarding a greener waste management approach that no longer relied on bigger landfills as the only viable solution to cope with the city's waste.

This was followed by 'A Policy Framework for the Management of Municipal Solid Waste in Hong Kong (2005–2014)' unveiled by the former Secretary for the Environment, Transport and Works, Sarah Liao Sau-tung, in 2005, which set out a wide range of policies covering waste avoidance, recycling and pipe-end solutions such as incineration (Environmental Protection Department, 2005a). In this plan, the timeline for each of the policies proposed was clearly stated, and it is believed that it was Liao's intention to avoid slippage of policy development progress. This was considered to be the most comprehensive plan compared with the other previous plans released by the colonial government or the SAR government.

Should all of Liao's proposed policy measures have been implemented according to the timeline stipulated, the waste problems of Hong Kong would have come under control, even if they had not been totally resolved. However, the policy framework has not been treated seriously and many of the policies stated were not followed through by the responsible Principal Officials when Liao stepped down from her position in mid-2007. The public perceives that any of the government's unveiled policy plans are meant to be a blueprint that it will act upon, irrespective of changes in the respective Principal Official. Officials stepping down due to retirement or transfer to another bureau often happens in the government; however, such changes would not and should never affect the implementation of the announced policies. The case in discussion is somehow different. The successor to Liao was Yau Tang-wah, who headed the Environment Bureau from 2007 to 2012. Yau seems to have picked and chosen some specific things from Liao's plan to work on.

Liao was fully aware that Waste Charging and Producer Responsibility legislation would bring significant waste reduction effects if implemented; she, therefore, included in the framework plan six types of products to be covered by the Producer Responsibility legislation including electrical and electronic equipment, vehicle tyres, plastic shopping bags, packaging materials, beverage containers and rechargeable batteries. The timeline for introducing the MSW Charging Bill was between 2007 and 2008 (Environmental Protection Department, 2005c). Yau did not start any public consultation process for Waste Charging when he took office, and only a few months before the expiry of his tenure did he launch a public consultation for Waste Charging. So, a delay in the legislative development of the law was expected and left for the next administration to follow.

Wong Kam-sing was Yau's successor, and he commissioned the Council for Sustainable Development to conduct the second phase of the consultation regarding the

implementation framework of the proposed Waste Charging law in December 2012. To the public, there seemed to be a delay in enacting the law, while some even felt that undergoing more consultations showed a lack of confidence in the government's ability to sell its plan to the public and legislators (Philip, 2013). Wong did not come from the civil service, but is an architect by profession who is well known for designing green buildings in Hong Kong. His mindset is quite open when engaging with him in a discussion of possible solutions to our environmental challenges. Wong believes solutions to environmental problems such as waste are multiple. He accepts applying software and hardware, that is education, legislation and technologies, to cut down the city's waste. Wong's mindset is similar to that of Liao and is quite different from that of the colonial government which had a strong belief in relying on hardware to manage our waste.

One of the cases worth mentioning is the Food Wise Hong Kong Campaign aimed at reducing food waste and with an icon called the Big Waster, which was launched in 2013. Wong was bold to invest resources in developing a creative campaign to address food waste, which constitutes the largest portion (33.3% in 2015) of MSW in Hong Kong. He believes that food waste could be reduced through public education, and as such the government needs to not merely pour money into building food waste plants to tackle it.

Quite a big change in the government mindset and strategies in certain aspects of waste management from the 80s to the present was reflected by Wong. Technology enhancement and higher public environmental concern are factors propelling such changes; however, there are areas that still require breakthroughs in the government mindset, if bigger improvements are to be achieved.

6.2.2 Two Types of Measures—Hardware and Software

The Environmental Protection Department was acquainted with applying proven engineering solutions, which are mainly hardware, to tackle our solid waste from day one. Landfills and incinerators were the main types of hardware to manage our solid waste, although the standards of this hardware were lax compared with today's standards. However, with the public's increasing environmental and health concerns, the last incinerator located at Kwai Chung was closed in 1997, and all the city's solid waste was then absorbed by the three strategic landfills based on the advice of technical consultants employed by the government.

Our government was criticized for its strong reliance on advice given by external consultants, for example, the full reliance on a single solution—the landfill to deal with our solid waste—is one of the classic examples of failure in holistic waste management. Consultants in that era usually offered technological solutions as most were engineers; engineers will inevitably recommend engineering solutions as they are not environmental advocates. The government trusted the consultants' advice that by building three strategic landfills it would be able to manage our waste for several decades. However, our waste disposal continued to rise, thus shortening the

life of the landfills, but the government offered no other solutions and it also feared that incinerators were unwelcome to the public and environmentalists.

In the waste management hierarchy, recycling is in the middle level; it can be facilitated by hardware coupled with software—education. The government designed the three-colour recycling bins and has put them in public places since 1998. These bins were designed originally to collect waste paper, cans and plastic bottles, and the shapes of the 'mouths' give hints to the public about what items they collect. However local green groups are quite vocal and their software approaches have included campaigns advocating waste reduction such as No Plastic Bags, No Foam Boxes, etc. Government officials had no experience of promoting environmental messages to the public, but they were aware of the effects of environmental campaigns and education. The government, therefore, launched a quasi-NGO called the Environmental Campaign Committee (ECC) in 1990 supported by EPD officials who play the role of secretariat. It also appointed environmentalists, representatives from NGOs and commercial bodies to sit on the Committee to play a role in promoting environmental awareness in society, as the government realized the success of green NGOs in raising public environmental awareness that has filled the gap that hardware approaches cannot. The ECC also handed out grants to support NGOs doing environmental programmes to echo the annual ECC theme of enhancing the educational effects. Since then, most of the software approaches have been handled by the ECC instead of the EPD which continues to focus on pollution control and law enforcement.

Wong Kam-sing was appointed Secretary for the Environment in 2012 and he believes that both software and hardware approaches are needed to tackle the critical waste problems. He released two long-term plans addressing the city's waste problems, namely the Hong Kong Blueprint for Sustainable Use of Resources (2013–2022) and A Food Waste and Yard Waste Plan for Hong Kong (2014–2022) in 2013 and 2014, respectively. He made a change to the perception of waste within the government, considering it as a resource; thus, the government should have policies to ensure that such resources be used in a sustainable manner.

Wong persuaded the Legislative Council to pass an amendment to the Plastic Shopping Bag Levy Scheme to cover all retailers in Hong Kong effective 1 April 2015, as the first phase only covered some 3,000 retailers. Other software approaches have included the legislation related to Producer Responsibility for glass beverage containers and waste electrical and electronic equipment (WEEE), whereby a levy will be added to beverages packed in glass containers and eight types of electrical and electronic equipment. The government will then have the money to employ contractors to recover glass bottles and WEEE in the community. Another effective software approach is the Waste Charging law where Wong told the public that the government is committed to launching a new law to charge the domestic and commercial sectors for waste disposal based on quantity. He expected that the law will take effect in the second half of 2019 at the earliest. There are uncertainties as to whether the law can be passed by the Legislative Council as some political parties have stated that they do not support the idea of waste charging.

In terms of hardware, three major waste treatment facilities have been built in recent years. First, the T-park is a large-scale sewerage treatment facility operating

since 2016. Second, the 200-tonne organic waste treatment facilities (OWTF) will begin accepting food waste in the second half of-2018. Third, the WEEE treatment plant also began its operation in the fourth quarter of 2017. The 3,000-tonne integrated waste management facilities (IWMF) proposed in Liao's framework plan was planned to be completed by 2014, but it has suffered serious delays. The timeline of the IWMF stated in Wong's Blueprint is between 2019 and 2022. The government claimed that it is a state-of-the-art waste treatment facility that will greatly reduce the volume of MSW before landfill disposal, but many environmentalists have commented that it is just a cleaner incinerator that might destroy materials if no comprehensive pre-sorting mechanism is included in the facilities. As Wong was appointed Secretary for the Environment again by the new administration in July 2017, there is an advantage of continuity, which will save time for the Secretary to get acquainted with the government operation. Under the Principal Officials Accountability System, the public is expecting Wong to deliver according to the targets and timeline stated in the blueprints, whether they are hardware or policies.

6.2.3 Responses from Society

Have any significant improvements been made because of government policies? This is a question often raised by legislators, media and the public. In terms of policies, there should be two that are related to charges which made quite noticeable improvements. The first is the Construction Waste Disposal Charging Scheme and the other is the Plastic Shopping Bag Levy Scheme.

6.2.3.1 Construction Waste Disposal Charging Scheme

The Construction Waste Disposal Charging Scheme was initially enacted in 2005 with the aim of reducing the disposal of construction waste in landfills by encouraging reuse through financial disincentives. For each tonne of construction waste dumped in landfills, the charge was HK$125, and was increased to HK$200 in 2017 due to the rebound of construction waste dumped in landfills in the last couple of years. Under the revised charging scheme, if putrescibles such as timber are removed from the construction waste, contractors can pay only HK$71/tonne to dispose of such inert construction waste at Public Fill Reception Facilities (Environmental Protection Department, 2017a).

Before implementing the waste charge, Hong Kong generated over 58,767 tonnes of construction waste per day in 2005. When the waste charge was implemented from January 2006, the amount dropped to 29,884 tonnes per day in the same year, which is a significant drop of 49.1%. This significant drop in construction waste being dumped in landfills indicated that if contractors make an effort to prevent the mixing of waste at construction sites and to reuse the sorted materials, then almost half of the construction waste could be reduced (Fig. 6.7). As the charge increased in

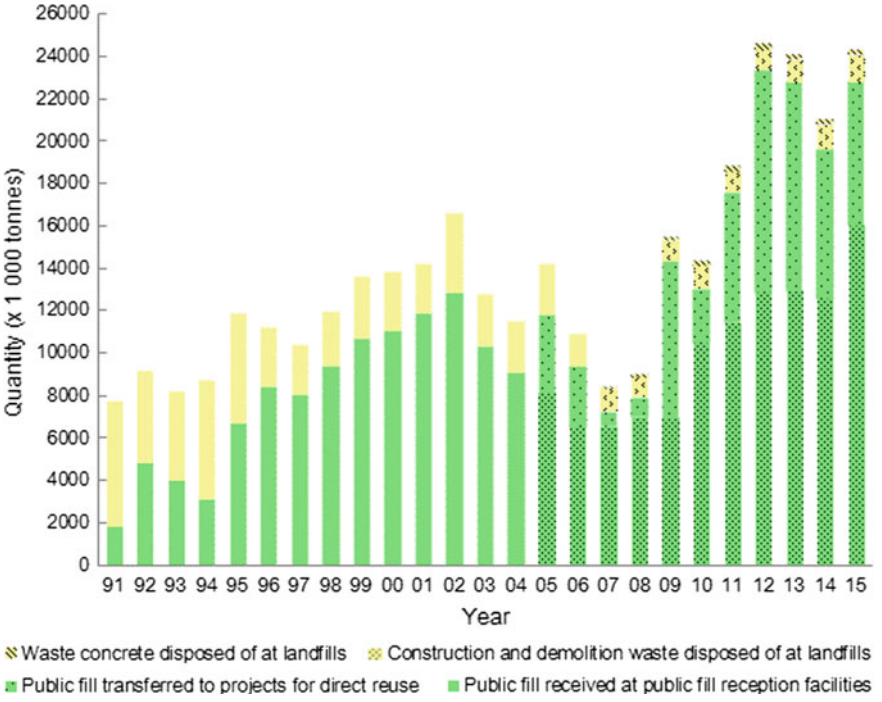

Fig. 6.7 Quantity of construction waste (1991–2015), (EPD, 2016a)

2017, there should be further reduction in construction waste disposed of in landfills; however, we can only learn the outcomes when the relevant data from the Monitoring of solid waste in Hong Kong 2017 report is unveiled by the government later in 2018.

6.2.3.2 Plastic Shopping Bag Levy Scheme

Hong Kong people were criticized for decades for using plastic shopping bags excessively and beyond our actual needs. According to a government landfill survey in 2005, around 8 billion plastic shopping bags were disposed of at landfills every year. This was equivalent to an average of more than three plastic shopping bags per person per day. The government and green groups have separately launched various campaigns in an attempt to lessen the use of plastic bags. However, since all the campaigns were voluntary approaches, the reduction in bag usage was insignificant. Green groups kept pushing the government to develop legislation to tackle this problem. Finally, the Plastic Shopping Bag (PSB) Levy Scheme was endorsed by the Legislative Council, and from 7 July 2009 some 3,000 registered stores, including mainly supermarkets, were required to charge customers 50 cents per plastic shopping bag.

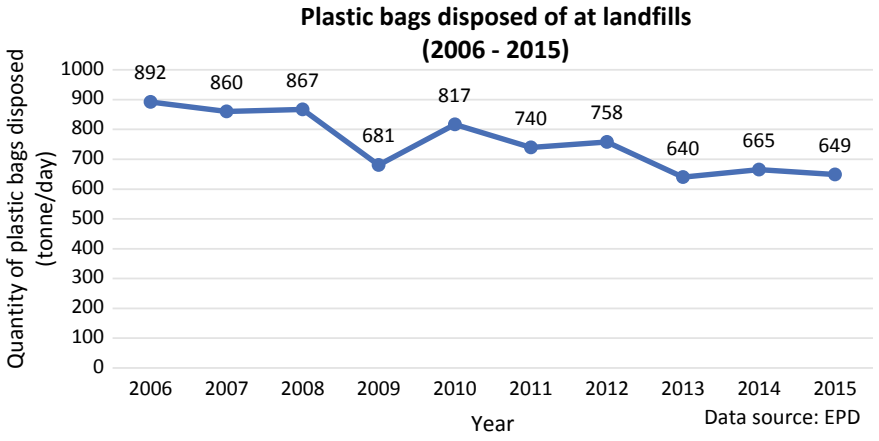

Fig. 6.8 Quantity of plastic bags disposed of at landfills. *Data source* EPD

To understand what differences the PSB Levy Scheme has brought to shoppers, through observation in supermarkets, it is found just 50 cents had made a difference in the behaviour of Hong Kong people. Most maids, housewives and men did not take a plastic shopping bag that was once given for free by the supermarkets. Some brought along their own shopping bags or trolleys, others just held two bottles of milk in their hands. This somehow reflected that financial incentives yield immediate and better results than voluntary approaches.

The government claimed that after the first year of the PSB Levy Scheme, the plastic shopping bags distributed by those registered retailers had reduced by 90% based on its landfill survey done in mid-2010 (Environment Bureau, 2011). But the government later found that there was a bounce back to the decreasing trend of bag distribution by the registered retailers during the first quarter of 2011. The plastic shopping bags distributed by the registered retailers amounted to 12.4 million between 1 October 2010 to 31 December 2010, and that amount rose to 13 million for the first quarter of 2011. In view of the problem, government enhanced the legislation to cover all retailers to bring more effective improvements. The amended legislation took effect on 1 April 2015. The daily amount of plastic bags disposed in landfills started from a relatively high level of 892 tonnes in 2006, dropping to 681 tonnes in 2009, but with a rise to 817 tonnes in a year's time, which was followed by a descending trend to 649 tonnes in 2015 (Fig. 6.8). Some other common waste items such as paper and PET (polyethylene terephthalate) bottles did not show any significant reduction over the last 10 years as no government regulations were launched to address such items. PET bottle waste even showed an apparent growing trend (Figs. 6.9 and 6.10).

The majority of the businesses in Hong Kong, in particular, the larger ones, adhere to government policies but they do not like over-control by regulations as they believe running businesses effectively needs a certain level of flexibility. When the Plastic

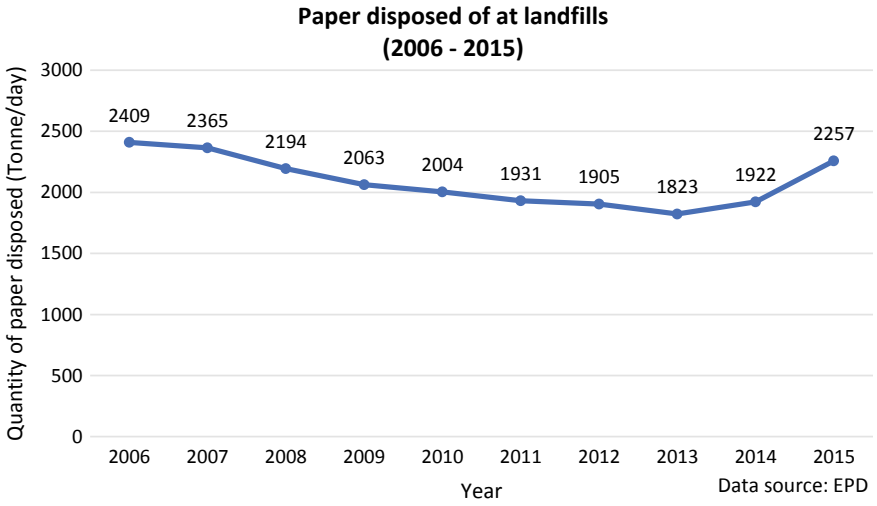

Fig. 6.9 Quantity of paper disposed of at landfills. *Data source* EPD

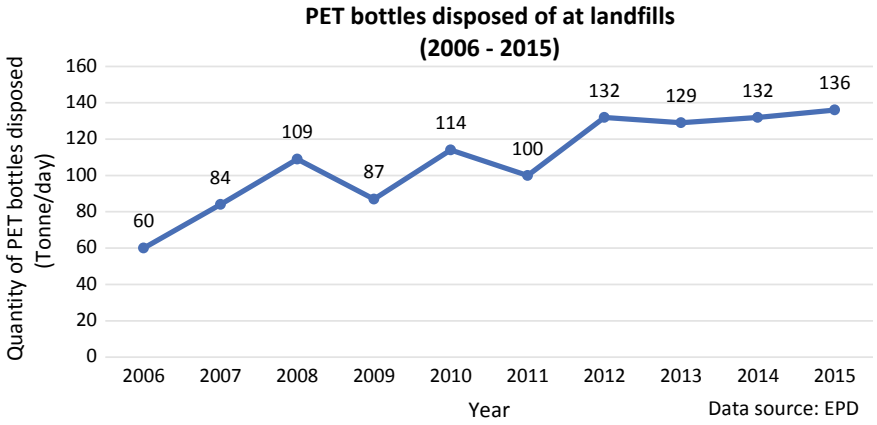

Fig. 6.10 Quantity of PET bottles disposed of at landfills. *Data source* EPD

Shopping Bag Levy Scheme took effect, registered retailers put up government produced posters and cards at the cashier counters to inform customers of the mandatory bag levy. Soon after the bag levy took effect, a new type of bag appeared and became popular. It is the non-woven bag, which the bag producers and retailers tactfully gave the nice name: 環保袋 (Environmental Bag) which made it sound environmentally friendly. However, it is just a thicker plastic bag that people are supposed to use over and over rather than using it just once and disposing of it. Under the first phase of the bag levy law, non-woven bags were exempted from any bag charge. Companies foresaw that the law would cover more retailers in the future, so they reacted swiftly

to the law by changing from giving out single-use thin plastic bags to more durable non-woven bags to customers. However, not just retailers, but many events and conference organizers also changed to giving out non-woven bags at their events, thus creating another kind of bag problem. Today, every person probably has five or more non-woven bags at home or in the workplace.

The other retailers that were not covered by the plastic shopping bag levy law simply did business as usual by giving out free plastic bags to customers until they were regulated, even though most of the big businesses had corporate environmental policies stating clearly their environmental responsibilities. To address the rebound of the plastic bag disposal problem, the bag levy was strengthened on 1 April 2015 to cover all retailers in Hong Kong to enhance its strength in cutting the use of plastic shopping bags. A couple of large fashion retailers had their own way of dealing with the upgraded bag levy; Uniqlo and H&M separately announced that they had decided to change to paper shopping bags to replace the existing plastic bags. This means that they were not prepared to echo the law which was expected to bring improvements in waste reduction. They did not offer a reason for the change, but it is quite apparent that their decision was made purely based on business consideration. It is believed that they were afraid that if no free shopping bags were offered to the customers, it might affect their company's bottom line.

Recognizing the decision of these two retailers, the author wrote repeatedly to persuade them to change their decision by emphasizing the harm and damage plastic shopping bags have brought to the environment. H&M replied with their reasons why its shops in Hong Kong decided to use paper shopping bags to replace the existing plastic bags. Uniqlo replied via email on the morning that the bag levy came into effect, saying that it will charge the same amount of 50 cents for the plastic bag and the paper bag. Seems Uniqlo had already produced a lot of paper bags, so charging for both types of bag was a viable solution that would prevent wasting the bags. Re-observation has been made on 1 April 2015 to observe if there was any change in the two shoppers' behaviour. Uniqlo had put up signs at the cashier counters reminding customers of the bag charges, while H&M had not put up any similar signs. Most of the shoppers at Uniqlo used their own shopping bags to carry the products they had bought or simply refused to take a Uniqlo bag to avoid paying the 50 cents. Shoppers at H&M simply used the free H&M paper bags to carry the products they had bought. Well, the difference is apparent in this case, but the story has not yet ended.

The government and NGOs often use quite different approaches to make environmental improvements. The government uses the approach of legislation, and guidelines when legislative control is not applicable, whereas NGOs use the approach of lobbying, applying public pressure and education. While persuading the two fashion retailers through written communications, the author also expressed the views and comments openly regarding their decision via the media, which might be given them some kind of pressure. Having gained a small victory in persuading Uniqlo to change its business decision at the last minute to echo the bag levy legislation, the author kept communicating with H&M's Hong Kong office and even wrote to its head office in Sweden. In mid-March 2016, H&M Hong Kong office wrote to inform the author that its shops in Hong Kong will start charging 50 cents for each

shopping bag distributed to customers despite its paper shopping bags not being regulated by the law. Environmental policy is a form of legislative measure; government officials can only enforce it when legislation is in place, and it was not the tradition for officials to persuade commercial firms to change their business decisions, even if such a decision goes against the policy goal. Legislative measures are often more effective than voluntary approaches; however, when the public or businesses try to get around legislative measures, non-government organizations can always play their role through education and motivation to make some achievements.

6.3 How to Resolve Our Waste Problems?

6.3.1 Finding a More Sustainable and Holistic Solution

As the city's waste problems are becoming more critical, the public expects the government to come up with practical solutions and to lead the whole society to resolve the problems together, instead of launching piecemeal campaigns and voluntary schemes. The holistic waste management approach is the direction our society should embrace; it is an approach encompassing 'Avoidance', 'Reduction', 'Reuse', 'Recycling', 'Treatment' and 'Disposal'. At the same time, we need to use the Waste Hierarchy as the guiding principle and put heavy emphasis on its upper levels such as waste avoidance, which will yield the greatest outcome with the minimal effort (Environmental Protection Department, 2005b).

Our government is well aware of the Waste Hierarchy, but the unveiled policies so far and the waste disposal trend of Hong Kong over the last decade reflect that the government has not put enough emphasis on the upper levels of the Waste Hierarchy. Green NGOs have urged the government for years to implement Waste Charging by applying financial disincentives to drive behavioural change, but such effective policy has gone through only repeated public consultations and is still on the administration's drawing board. We are all aware that education takes a long time to come to fruition, but once people are motivated and have converted to a green mindset, reducing waste will become their daily habit, whether there is legislation or not, which can be considered as the most sustainable solution.

Environmental education is not a core subject in schools, and the Environmental Protection Department has not actively reached out to educate students, the working class and housewives on the various issues related to waste reduction. Therefore, even though the public's environmental awareness, in general, is relatively higher today, most people still have misunderstandings about the appropriate ways to reduce and recycle waste. A closer look at plastic recycling bins placed in public places will reflect the misunderstandings of the public regarding waste separation at source and clean recycling (Photos 6.1 and 6.2).

Photo 6.1 With permissions from The Green Earth

Photo 6.2 With permissions from The Green Earth

6.3.2 The Government's Roles

There has been no shortage of strategic framework plans and blueprints developed and launched in the last two decades by the Hong Kong SAR government to address the city's solid waste issues. However, it needs the genuine buy-in by the large civil service team of the entire government, in particular, the relevant departments, to work hand in hand with the Environment Bureau to take those plans forward according to the stated timeline. However, this seems to be a difficult part in our government since cross-departmental collaboration on environmental policies rarely happens. Each department has got a clearly defined scope of work for its officials to follow.

Policy plans have been announced, but the change of Environment Minister under different administrations seems to have affected the continuity of the plans. Take 'A Policy Framework for the Management of Municipal Solid Waste for Hong Kong (2005–2014)' as an example; many of the items stated in the plan did not get worked out according to its proposed timeline. The MSW waste charging legislation was supposed to take effect between 2007 and 2008, however, its draft legislation was not submitted to the Legislative Council before the end of the term of the last administration headed by former Chief Executive Leung Chun-ying. The previous Environment Ministers had already unveiled a spectrum of solutions to Hong Kong waste problems; what we really needed was the commitment of the Principal Official to drive and complete these policy measures which were experiencing serious delays.

Engaging the public to get them to understand why an environmental policy is needed to tackle the city's waste crisis is a must-do step and cannot be treated lightly. When the public and political parties have lots of misunderstandings and concerns about a proposed policy, it is unrealistic to expect them to buy-in and vote for it at the Legislative Council. The proposed MSW charging legislation is a classic case of great concern for the public and political parties since it was proposed by the previous administration. For such legislation that is relevant to every citizen and business in Hong Kong, organizing merely two public forums to give more details will not be sufficient to ease the public concerns and misunderstandings. Instead of sensible questions raised during the forum the author attended, many grievances were raised by the audience, and the time constraint has prevented more interactions from taking place to iron out misunderstandings. Such a cosmetic consultation just allowed the officials to report that they had done public consultation, but this has not earned greater buy-in from society.

It is expected senior officials and not just the Environment Minister to reach out to the 18 local districts at different times to engage the public and businesses as a core exercise to earn the necessary public support for passing the legislation. This effective legislation does not require huge capital investment in infrastructure; it only requires the government officials' time and genuine efforts to convince the public to embrace the legislation. In the current political environment, government officials are often criticized by some people or political parties during public consultations of various topics; therefore, it made some officials unwilling to face the public.

6.3.3 The Private Sector's Roles

It is strongly believed that the private sector should play a key role in tackling Hong Kong's waste problems, or at least to take care of its own waste including product packaging waste and products when they reach the end of their life, the private sector, in general, has seldom made a move voluntarily unless required by legislation. The private sector is well aware of the city's serious waste problems; unfortunately, businesses tend to act lightly or tinker on the edges to show the public that they have contributed their part for the environment. In most cases, businesses prefer to take part in high-profile campaigns run by government or green NGOs, because they know they stand a chance of gaining some publicity in return. For instance, there are several local beverage companies doing business in Hong Kong, and their main or sole aim is to sell more beverages to gain a larger market share for more profits. Though the public can see sustainable policies covering waste management or climate change topics on their official website, it is hard to identify any significant environmental actions or plans conducted by these companies. What you will see are some small scale or ad hoc activities carried out within a limited number of schools or shops, which can in no way resolve their own waste problems.

Hong Kong's waste problem is mainly the waste generation that seems to keep growing without any sign of slowing down; therefore, what we need to do is reduce waste generation at the source instead of just concentrating on recycling used plastic bottles in the case of the beverage industry. However, to reduce waste generation at source means selling fewer products, which is against the beverage companies' profit-making aim. It is unrealistic to think that the private sector will share the government responsibility for tackling our waste problems, unless there are some business opportunities. For example, the government issued tenders inviting the business sector to manage the public recycling bins, and such waste management service will become a business opportunity for successful bidders to make profits by providing regular services to collect recyclables from the public bins. It has turned out to be a profitable business as our government pays the contractor around HK$9,000 for each tonne of recyclables collected from the public recycling bins (Audit Commission, 2015). Recyclers who run their business without government support can in no way earn such a high amount from collecting and selling recyclables of paper, plastic or even metal. Recycling companies act similarly to the mainstream businesses as they won't do businesses that yield zero profit. That is why low-value recyclables, such as glass bottles, were not collected by recyclers, and the destination is the same as that of other trash—landfills.

To give a legitimate role to the private sector to manage waste, the government must develop legislation to mandate businesses to act, and one of the effective policies is Producer Responsibility. When such a policy is in place, producers must take care of the waste they produce using their resources instead of shifting their responsibility to the government. For example, in 2005, the EU mandates that between 55 and 80% by weight of all packaging waste be recycled by the end of 2008, which has

clearly required the producers to shoulder their responsibility (U.S. Environmental Protection Agency, 2007).

6.3.4 The Individual's Roles

The spirit of Producer Responsibility is to put the responsibility on producers whereby they have due responsibility to take care of the waste (including packaging and end-of-life products) they produce, and this applies to product manufacturers. Another principle is the Polluter Pays Principle, where consumers must pay for the cost of treating their waste. When the majority of the public is aware that their lifestyle has strong connections with waste disposal and are being reminded of ways to reduce and channels to recycle, they will probably assume a greater role in waste reduction. On average, each person in Hong Kong produces 1.39 kg of waste every day (2015 level). If we see ourselves as socially responsible citizens, then we should at least find out whether we have produced less or more than that average amount, as well as our waste composition. It could be a simple and interesting exercise for family members to conduct for a week to identify what types of waste they produced most and whether part of the waste is avoidable and recyclable.

Individuals are believed to be much easier to motivate to reduce waste than businesses and the government because individuals need not be concerned about the corporate bottom line and the complex official procedures. If you are an environmentally conscious person and a responsible consumer, you will choose products with less packaging and only shop when there is a real need. You will do your best to avoid using one-off disposable products, bring your multiuse drinking water bottle and a shopping bag whenever you go out, and you won't buy take away food to avoid generating waste at source. When you finish reading the newspaper or magazines you will put them into the paper recycling bin. The main part of waste you might generate in a day would probably be the food waste generated from meals. And if you cook only what your family members can consume comfortably, even if you do not have food waste recycling facilities at your residential building, the amount of waste should be minimal.

It is not difficult to establish a waste-conscious mindset and culture in society if people of all ages are educated about the topic of waste and the environment while the government also keeps promoting waste reduction via traditional and new media channels aided by attractive campaigns. The Big Waster campaign that the Environment Bureau launched in 2013 with the aim of reducing food waste is considered a successful case. Two years after the launch of the campaign, the government reported that the food waste disposal amount of 2015 had reduced by 7.1% compared with that of 2014. As the success is by no means due to mandatory requirement, the campaign should continue to let the key messages of food waste reduction be heard continuously to motivate more people and businesses to take actions to tackle our waste problems together.

6.4 Conclusion

Holistic Waste Management is not just jargon for government officials to talk about when approached by the public or media; it is a strategy the government should uphold and implement to develop policies and hardware for waste management that can effectively suppress waste generation at source and reduce waste disposal at the end. The upper levels of Holistic Waste Management require education and motivation to achieve and sustain; however, it seems that the majority of Hong Kong people do not practice waste avoidance, reuse and recycling regularly for various reasons. Therefore, it is vital for the government to devote resources to promoting and facilitating waste avoidance, reuse and recycling in the business sector and community.

Many cities in Southeast Asia, the EU and the US are aware of the importance of Holistic Waste Management and therefore have developed legislation, technologies and systems coupled with promotions to manage their solid waste and recover resources from it. For instance, the Taipei government has implemented a waste charging policy, named 'Per-bag Trash Collection Fee Program' since 2000, which is based on its Pay As You Throw (PAYT) system. Before implementing the policy, the government organized over 740 briefing sessions for the public and waste collection staff of buildings to get more to buy-in the policy. In 2003, the government implemented another recycling programme addressing household kitchen waste to further enhance the effectiveness of its waste charging policy. As a result of the combined effects of several waste reduction policies, the waste reduction rate reached 66.7% and the recycling rate reached 56.38% by December 2014 (Ecologic Institute, 2014). In 2013, the Environment Bureau of Hong Kong SAR government led a delegation with scholars and green NGOs to visit Taipei to learn Taipei's success in waste management.

The Packaging Ordinance implemented by the German government as early as 1991 is another good reference for the world. The Ordinance requires manufacturers and distributors to take back their product packaging for reuse or recycling. Germany is also known to be one of the advanced nations in developing and applying technologies to sort mixed recyclables, which has achieved much greater efficiency compared with places where waste sorting is performed manually by workers (Skoda, 2018). The Chinese government bans the import of 24 types of foreign waste from 2018 has given the world a clear message that every nation should handle its waste within its boundary and China is no longer the waste dumping ground for other nations. Hong Kong and other countries who have been relying on the mainland to process our waste should immediately examine our waste management direction and should not take it for granted that developing countries will forever receive waste that does not belong to them. Hong Kong is a developed and wealthy city in Asia with very efficient systems for transport, telecommunications, finance and banking, etc.; the government should, therefore, speed up the development of all other measures needed to support Holistic Waste Management to make waste management one of the efficient systems in Hong Kong that we can all be proud of.

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Edwin Che Feng Lau is Founder and Executive Director of The Green Earth. Mr. Lau has been actively engaged in environmental protection work since the late 1980s and founded The Green Earth in early 2016. He keeps motivating the business sector and public to tackle pressing issues related to waste management, air pollution and climate change by acting green. Mr. Lau sits on several government advisory committees to offer advice on waste reduction, water conservation, public environmental education, etc. In 2009, Mr. Lau. was awarded the Medal of Honour by the HKSAR government in recognition of his long-term contribution to the cause of environmental protection and education.