Environmental problem of overuse of plastic packaging environmental sciences essa...

Globally, the use of plastic has increased substantially due to its useful properties. ‘‘ Plastics are inexpensive, lightweight, strong, durable, corrosion-resistant materials, with high thermal and electrical insulation properties.’’ (Thompson, 2009)Thereby, plastic production has increased hugely from 0. 5 in 1950 to more than 260 million tons in 2009 (Thompson, 2009). They account for 4 percent world oil usage (Hopewell & Kosior, 2009). More than a third of plastic is use for producing packaging, which is short-lived or even single use (Hopewell & Kosior, 2009)Unsustainable and over use of plastic and plastic packaging of product will post enormous negative impacts on environment, including pollutions in waste disposal and manufacturing. For waste disposal, incineration may produce toxic substances, such as burning PVC may create dioxins (Hopewell & Kosior, 2009). Additives like plasticizer also are toxic which creating pollution (Thompson, 2009). Littering in countryside and marine will destroy environment (Thompson, 2009). The waste increased burden of landfill due to slow degrading rate of plastic which occupied space (Thompson, 2009). For manufacturing, plastic will worsen global warming, increase greenhouse gas and run out of non- renewable resource (Tolinski, 2011) book. Plastic is by-product of oil and natural gas and produce by burning of fossil fuel causing pollutants. Hong Kong SituationIn Hong Kong, there are huge environmental problems of plastic waste disposal. Plastics are one of the enormous waste types disposed in landfills (EPD, 2013). In 2011, Plastic accounts for 18. 5% of total household waste, while paper contains 21. 1%, glass had 3. 2% and metals got 2. 2% (EPD, 2013). About 1. 8 million tons of plastic waste was produced each year (EPD, 2013). However, only 843 thousand tones were recycled (EPD, 2013). It is predicted that the existing landfills will be satuated in 2020 if waste level

is keep on rising at recent rate (EPD, 2013). Building the new landfill require huge construction cost and operation cost. It has cost nearly $6 billion to build our three strategic landfills, and the operating cost of the three landfills is around $400 million per year (EPD, 2013). Moreover, the occupying of space will cause economic loss as hindering further development. In addition, the expanding of landfill and use of incineration are strongly opposed by different stakeholders. Therefore, it is crucial to minimize the plastic waste. 3 Government contains some programmers and policies to reduce plastic waste. There were waste separation bins, plastic coding system and education programmers (EPD, 2002). Since 2005, government has widened kinds of recyclable plastic collected. All kinds of clean and dry recyclable plastic can be put into brown waste separation bins, which are placed in public area and estates (EPD, 2012). Moreover, Environmental Protection Department also adopted a voluntary plastic coding system of America for manufacturers (EPD, 2002). These can facilitate the sorting for recycle companies to ensure the homogeneous (EPD, 2011). Different plastic have various chemical combination which cannot re-process together due to different melting point book. However, the citizens are not required sorting by the code (EPD, 2011). 2, 3Nevertheless, there are constraints in minimizing plastic waste in Hong Kong. Firstly, there are small percentage of plastic waste were recycled when comparing with total amount of recycling materials. Plastics only accounts for 28%, while paper contains 42% and metals got 28% (EPD, 2013). There still a lot of room for plastic to improve. Secondly, low quality of recycling plastic were collected, such as contaminated plastic waste and mixed type of waste(EPD, 2002)2. These will raise cleaning cost and further sorting cost, reducing market value of

collected plastic waste (EPD, 2002)2. Thirdly, very little plastic waste was process recycling in Hong Kong, almost all (99. 5%) were sent to China and Vietnam for recycling (EPD, 2002). Lastly, there is low awareness of public on plastic recycling (EPD, 2002). This lead to inappropriate waste sorting and insufficient recycling plastic wasted collected, which worsens the problems.

Chapter 2 Literature review

Sustainable development

Public consumers play a crucial role in sustainable development especially in minimizing waste (Haque, 2000)2. Sustainable development is defined ‘ Meets the needs of the present without compromising the ability of future generations to meet their own needs’’ (WCED, 1987) 2In practice, Sustainable development needed changes of production and consumption decision (Gertsakis& Lewis, 2003). Consumer preference can influence the production decision of supplier. For example, the increasing consumer demand on sustainable production can give incentive to producer in supplying recyclable content product (Hopewell & Kosior, 2009). 2 The sustainable policy supported by consumer can cover the significant stages of production and consumption of a product (Gertsakis& Lewis, 2003). They included changes in design of product, production process, distribution, consumption or way of using and waste management. Universities students also take importing role in creating a sustainable environment. They can take the lead to carry out sustainable practice, promoting sustainability practice to society and develop social norms(Kaplowitz & Wilson, 2009) (Armijo de Vega, 2003). For example, they can demonstrate awareness and practices to increase environmental sustainability among the community

(Pike, 2003). Moreover, universities students and institutes enhance negative impacts on environment indirectly and directly (Alshuwaikhat & Abubakar, 2008). They have many activities that require consumption and production of waste, such as for education and science (Alshuwaikhat & Abubakar, 2008).(Kaplowitz & Wilson, 2009)Plastic waste minimization of consumer can be divided into two parts, including making purchasing decision and post-consumption behavior (Tonglet & Bates, 2004)1. 4Rs principal can be applied in the two types of waste minimization behavior in achieving sustainability (Gertsakis& Lewis, 2003) 2. Minimize waste when purchasing can support the replace and reduce principles, while reuse and recycle can be done after consumption. In waste management hierarchy, there is a preference order in the 4Rs, which is first emphasis on replace and reduce, followed by reuse and lastly with recycle. Thereby, minimization of plastic waste at point of consuming is even more important than the after action, which many people do not realize of it. 2Barr et al. (2001) and Ebreo and Vining (2001)

Environmental education

Environmental education cultivated global citizens the awareness and concern on global environment and its problems, which is aimed to act as a foundation for public to prevent and tackle the problems. (UNESCO, 1976). Environmental knowledge is one of the most important components in Environmental education (Day & Monroe, 2000). 1 Environmental knowledge is the understanding of environment basically and the environmental problems (Delavega, 2004). It can also be view as experiences gained. Knowledge can be acquired through difference channel, including from access to information directly and gain from experience (Delavega, 2004).

The effectiveness of knowledge acquiring will also affected the level of environmental behavior (Clay, 2005). Knowledge and pro-environmental behavior (Schultz & Mainieri, 1995) (Hornik & Narayana, 1995)1Some researchers found that knowledge is extremely crucial in affecting consumer pro-environmental behavior (Schultz & Mainieri, 1995; Hornik & Narayana, 1995). Many scholars suggested that huge internal barrier of pro-environmental behavior is due to insufficient knowledge, leading to ignorance and wrong concept (Schultz & Mainieri, 1995; Hornik & Narayana, 1995). Knowledge can develop pro-environmental behavior effectively, with a long term changes (Tasaday, 1991). The factors affecting recycling behavior can be divided into extrinsic and intrinsic (Hornik & Narayana, 1995). Consumer knowledge is an intrinsic facilitator with the strongest prediction ability of recycling behavior (Hornik & Narayana, 1995). External incentives are less important, such as monetary rewarding and community influence. Internal factor can generate long term behavior but external incentive may only induce short term one (Hornik & Narayana, 1995). When external incentive disappearing, the recycling behavior will mostly stop (Hornik & Narayana, 1995). Some also argue that those with high pro-environmental attitude will not ensure have consistent environmental behavior if they lack of practical knowledge. (Simmons & Widmar, 1990). It is found that there are mainly two kinds of knowledge that affecting the minimizing waste behavior. 111Firstly, they are knowledge about basic understanding of the environment. They included the importance and need of recycling, barriers and constraints of recycling, global and local environmental problems. Secondly, knowledge on environmental programs is important, such as types of materials that are recyclable, collection venue

and way of collection and sorting. (Hornik & Narayana, 1995)On the other hand, however, some argue that knowledge is not an important factors influencing pro-environmental behavior. Some believed they do not have any direct correlation 4. Knowledge alone cannot ensure pro-environment behavior, there should be other back up factors supporting the behavior, such as concern for the environment, external incentive and social norms1 (Tonglet & Bates, 2004) (Mckenzie-Mohr and Smith, 1999).(Nash, 2002). Moreover, some also suggested that the strongest factor of behavior is attitude such as values and emotions4. It can facilitate the acquiring of knowledge, which affecting the behavior(Tonglet & Bates, 2004) 1. Furthermore, barriers also being view as important factor affecting pro-environmental behavior, such as the time consuming and inconvenient 1. For recycling, the majors barriers are inconvenient for way of collection, collection venue and sorting. It is found that inconvenience a major factor affecting university students behavior (Kelly & Ganesh, 2006). Demographics and pro-environmental behaviorThere are varies views on the relationship between demographic variables and environmental behavior. Some found that demographic variables have certain extent in influencing environmental behavior (Clay, 2005). 1Income, age and education level were positive correlated with environmental behavior, such as recycle behavior (Clay, 2005). Moreover, gender also has relationship with that behavior (Clay, 2005). Nevertheless, some researchers believed that demographic variables roles are weak and being overemphasized, leading to neglect of other crucial factor (Schultz & Mainieri, 1995; Hornik & Narayana, 1995) 111.