

THE ROLE OF SOCIAL MEDIA ON RECYCLING BEHAVIOUR

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ABSTRAK

Tujuan penyelidikan ini dilaksanakan adalah untuk mengkaji tingkah laku penduduk di Pulau Pinang mengenai kitar semula serta mendapatkan pemahaman yang lebih jelas mengenai peranan dan penggunaan media sosial dalam mempengaruhi tingkah laku manusia. Selain sikap, norma sosial dan keberkesanan diri, kajian itu juga berhasrat untuk menyelidik dengan lebih mendalam tentang peranan kerajaan dan Badan Bukan Kerajaan (NGO) dalam perkara ini. Kajian ini dilaksanakan berdasarkan *Integrated Behaviour Theory/Theory of Reasoned Action*. Instrumen pengukur (borang soal selidik) diolah dan diedarkan kepada orang awam. Seramai 233 responden berjaya dikumpulkan. Kaedah SPSS dan *Partial Least Square* digunakan untuk memperoleh analisis deskriptif dan mengesahkan model penyelidikan yang dicadangkan. Analisis kajian mendapati sikap, norma sosial, media sosial dan keberkesanan diri signifikan dan mempengaruhi niat penduduk Pulau Pinang terhadap kitar semula. Hubungan antara niat dan tingkah laku diperkukuhkan lagi dengan peranan kerajaan. Hasil penyelidikan ini mendapati, keberkesanan diri dan sikap memberi impak yang lebih besar terhadap niat kitar semula berbanding dengan norma sosial dan penggunaan media sosial. Walau bagaimanapun,, peranan NGO didapati tidak signifikan kepada hubungan niat dan tingkah laku kitar semula. Responden kajian ini yang kebanyakan terdiri daripada penduduk bandar, tidak mewakili orang-orang yang tinggal di kawasan luar bandar, penduduk miskin dan warga emas di mana penggunaan teknologi media sosial adalah terhad. Hasil kajian ini memberi input yang berguna kepada pihak kerajaan supaya dapat melibatkan pihak-pihak yang berkepentingan serta menggunakan kelebihan media sosial bagi membentuk strategi komunikasi yang lebih berkesan bagi mengukuhkan tingkah laku and niat penduduk terhadap aktiviti kitar semula.

ABSTRACT

The aim of this study is to examine recycling intention behaviour among the general public in Penang and gain better understanding on the role and usage of social media in influencing people's behaviour. Apart from attitude, social norms and self-efficacy, the study also intends to investigate the role of government and NGO on the strength of intention behaviour relationship with regards to recycling. This study applied the Integrated Behaviour Theory/Theory of Reasoned Action. An instrument was developed to measure the determinants of recycling behaviour among the general public in Penang. A survey was designed and disseminated to the public, 233 valid responses were collected. SPSS and Partial Least Square analysis were used to derive descriptive analysis and validate the proposed research framework. Through structural equation modelling, the findings indicated that recycling behavioural intention was significantly influenced by attitude, social norm, social media and self-efficacy. The intention behaviour relationship is further strengthened by government's role. Self-efficacy and attitude have larger effect on recycling intention than social norm and social media usage. However, NGO was found to be insignificant to the intention behaviour relationship. The respondents of the study constitute of mainly urbanites, thus may not be representing people living in the rural areas, poor and older population where availability and usage social media technology might be limited. The findings of this study provided useful information for the government to engage with other stakeholders and make use of the social media advantage to shape a more effective communication strategy to buttress recycling behaviour among public.

CHAPTER 1

INTRODUCTION

1.1 Overview

Population boom has always been one of the many factors contributing to increased amount of waste disposal over the years. Accelerated economic development, higher consumption rates and business activity have increased the volume of trash generated daily (Budhiarta, 2012). The National Recycling Programme was launched by the Government in 2000 and 2005. The implementation of the recycling program which involves all levels of society, including Non-Government Organizations (NGO), the private sector and residents is to ensure the national vision to achieve target of 22% recycling rate by 2020. It's sad to say that despite the launch, the envisioned target rate hasn't come any close.

Greater purchasing power has led the people to consume different types of goods, making waste disposal such an intricate matter in Malaysia (Agamuthu et al., 2009). Although Malaysia's economic is progressing well, however its waste management and recycling effort is still underdeveloped and underachieved compared with other developed nations such as Denmark and Japan (Agamuthu & Fauziah, 2010). Countries like Singapore, recorded a very impressive 61% recycling rate, far much higher than Malaysia and practices waste minimizations extensively (Singapore National Environmental Agency). According to Uiterkamp et al. (2011), economic affluence contributes to greater growth and therefore the more amount of solid waste generated.

Over the past 4 decades, Malaysia's population has increased over 170% and has a population of 29.7 million people comprising of local citizen and foreigners as of year 2013 (Table 1.1). Moreover, Abushamala et al. (2010) reinforced the association between population growth and waste generation based on data obtained from the Ministry of Housing and Local Government and Department of Statistics, Malaysia indicating that waste increases in tandem with population growth (Figure 1.1). Owing to this rapid population growth, an effective and efficient waste management is crucial and imperative.

Table 1.1: Population of Malaysia

Years	million					
	1970	2009	2010	2011	2012	2013
Population	10.9	28.1	28.6	29.0	29.3	29.7

Source: The Malaysian Economic in Figures 2013, Economic Planning Unit

Kathirvale et al. (2003) stated that the landfill disposal method is being the main disposal approach used in Malaysia. Meanwhile Tramudi et al. (2012) included dumping to be part of main solid waste disposal method. Landfills are not sustainable method and have its drawback largely due to increased waste, shortage of readily available sites and soaring land prices (Manaf, et al., 2009). The annual rate of solid waste production in Malaysia has been increasing steadily at a rate between 3-4% (Manaf et al., 2009). Saeed (2009) reported that 48% of solid waste generated in Malaysia comes from the residential sector followed by commercial waste (24%); street cleansing (11%); institutes (6%); and industry and construction (4%).

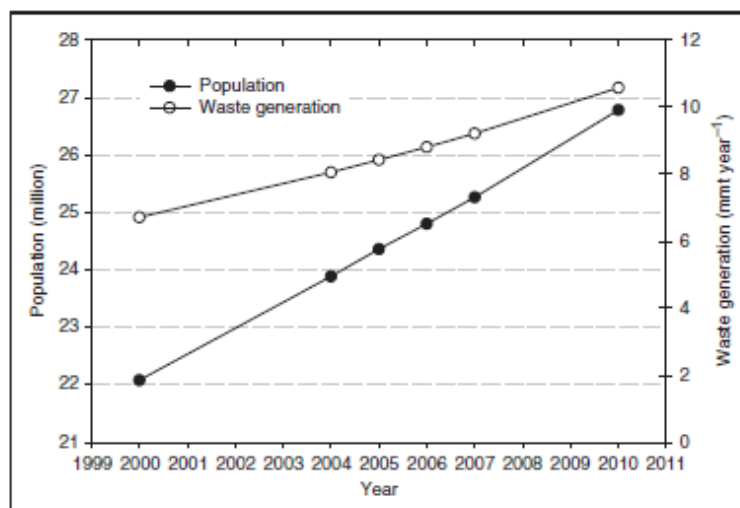


Figure 1.1: The relationship between population and waste generation in Malaysia (Abushamala et al., 2010)

Back in the year 2006, about 7.34 million tons of solid waste were generated (Siraj, 2006) while in 2011, daily waste generation had increased to 30,000 tons (Agamuthu & Fauziah, 2011). It was reported that approximately 75% of collected wastes were disposed in landfill and dumps and disappointingly only 5% was recycled. Another 20% are either burnt or illegally dumped in rivers and other sites (Agamuthu et al., 2009).

Table 1.2: Waste disposal method in Malaysia (Agamuthu et al., 2009)

Methods	2002 (%)	2006 (%)	2020 (%)
Recycling	5.0	5.5	22.0
Composting	Nil	1.0	8.0
Incineration	Nil	Nil	16.8
Inert landfill	Nil	3.2	9.1
Sanitary landfill	5.0	30.9	44.1
Others (ordinary dumping, etc)	90.0	59.4	Nil
Total	100.0	100.0	100.0

Malaysia over the years have been facing this immense challenge to effectively manage solid waste through better efficient collection, recycling, treatment and disposal mechanism that can lead to various environmental hazards, risks and pollution. Thus, depending solely on landfill and dumping are not a sustainable approach in the long run given that it's a matter of time, these landfills will reach its full capacity while other approaches as stated in Table 1.2 are unlikely to be achieved unless the Government undertakes serious efforts to realise its target, which is about 6 years from now.

Table 1.3: Number of landfill sites by states in Malaysia (Johari et al., 2014)

State	Operational	Closed	Total
Johor	14	23	37
Kedah	9	6	15
Kelantan	13	6	19
Melaka	2	5	7
Negeri Sembilan	7	11	18
Pahang	16	16	32
Perak	17	12	29
Perlis	1	1	2
Penang	2	1	3
Sabah	19	2	21
Sarawak	49	14	63
Selangor	8	14	22
Terengganu	8	12	20
Kuala Lumpur	0	7	7
Labuan	1	0	1
Total	166	130	296

Table 1.3 shows Sarawak and Sabah has the highest number of landfills sites with 49 and 19 operating landfills whereas Penang has only 2 landfills namely Pulau Burung and Jelutong landfill with the latter been closed and used for dumping of construction wastes.

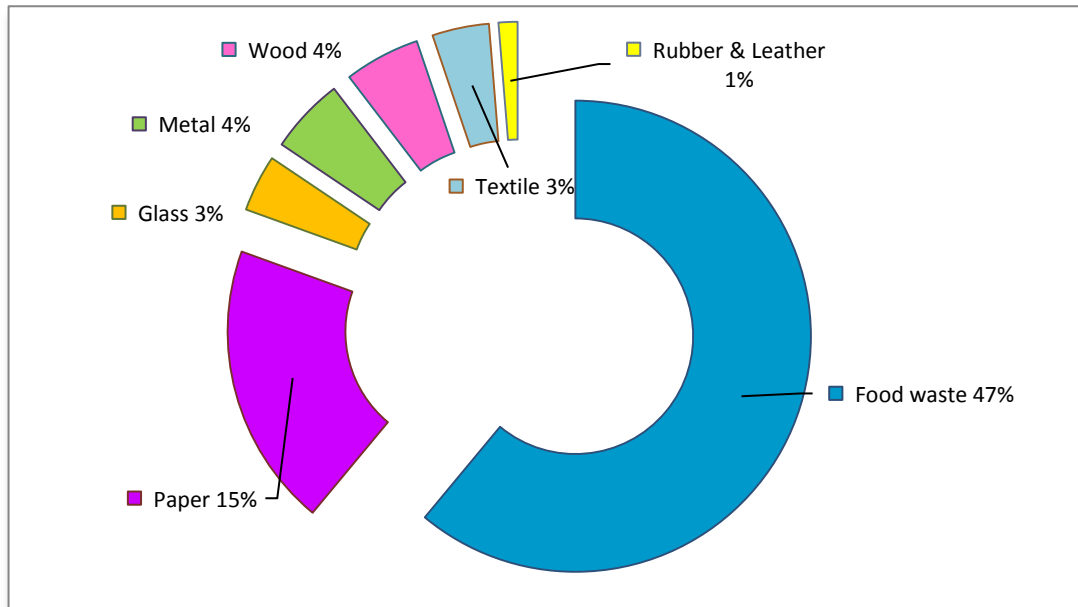


Figure 1.2: Composition of household waste (JPSPN, 2005)

1.2 Regulation of Solid Waste Management in Malaysia

Johari et al. (2014) described solid wastes as garbage discarded by end consumers, be it household or commercial sources has no or less value. Meanwhile, municipal solid waste refers to waste generated in urban areas. In the past, solid waste management in Malaysia was decentralised (Abbas & Wee, 2014) and the local authority in respective states played an important role as they were responsible for land matters (allocation of landfills & facilities) (Nadzri & Larsen, 2012).

Tarmudi et al. (2012) stated earlier solid waste legislation were inadequate to achieve integrated sustainable waste management. On top of that, local authorities responsible for management of solid waste received increased criticism from the public (poor quality, limited resources, lack of human resources and technology) (Agamuthu et. al. 2009). Thus, the government took steps to address the weaknesses by introducing Solid Waste and Public Cleansing Management Act 2007 (SWPCMA). Concurring with that, the National Solid Waste Management Department (JPSPN) and Solid Waste and Public Cleansing Management Corporation (PPSPPA) were established due to the increasing industrial waste generation and complexity in managing solid wastes. Both come under the purview of Ministry of Housing and Local Government.

The new act was progressively introduced beginning September 2011 (Johari et al., 2014) and with that, the executive power on public cleansing and solid waste management in Peninsular Malaysia was transferred from the Local Authorities to the Federal Government (Sreenivasan et al., 2012). One of the key aspect of the act is the local authorities were no longer responsible for solid waste and public cleaning management. JPSPN was established to ensure the strategies outlined under the National Strategic Plan for Solid Waste Management are duly governed, facilitated, coordinated and implemented.

By doing so, the government has also amended the solid waste management provisos in the earlier legislation to ensure coordinated jurisdiction among all the legislation related to solid waste management. Prior to the establishment of JPSPN, function of solid waste management were with the Engineering Division of

Environmental Health and Project Implementation Division, Department of Local Government (JKT), Ministry of Housing and Local Government. This function was later transferred to JPSPN and PPSPPA. Figure 1.3 below describes in brief the evolution of solid waste related regulation in Malaysia. SWPCMA was coined based on best solid waste management practices of developed countries such as Denmark, Japan and Germany. It particularly focused on managing sanitation & public cleanliness. It must be duly noted here that Penang and Selangor have decided to opt out of this centralised solid waste management scheme when it was enforced in the year 2011 which means the respective states and local authorities manages its solid waste (Abas & Wee, 2014).

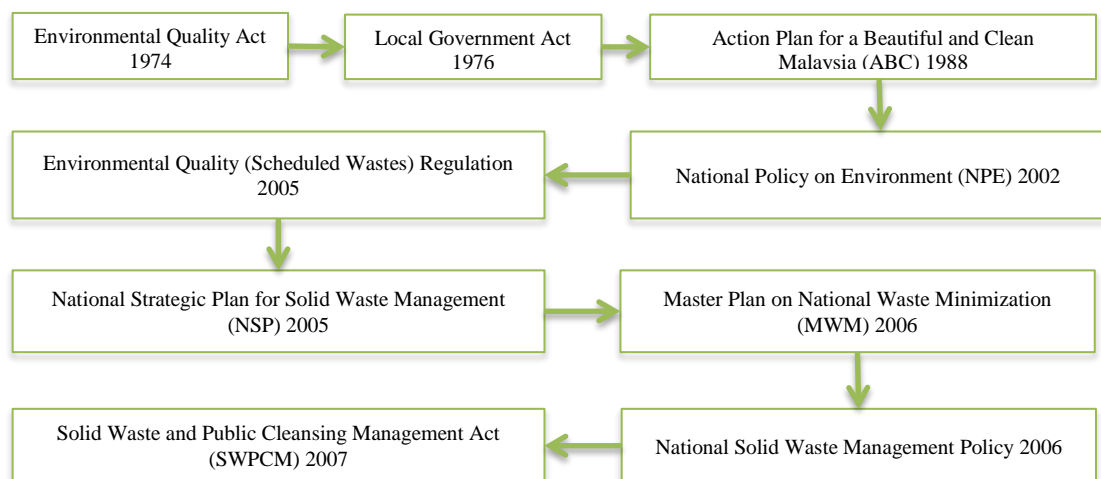


Figure 1.3: Evolution of solid waste related regulation in Malaysia

1.3 The Role of Social Media

In the past decades, there has been a new form of media, evolving from traditional mass media to the consumption of new media comprising the Internet and mobile phone communication. Communication approach has shifted from one-way to two

way interactive communication. New media has been conceptualized as an integrated, interactive and digital coded media (O'Neill & Boykoff, 2011). Social media is one of the new media form. In tandem with technology advancement, the emergence of social media is an instrumental tool in the lives of many people as it involves interaction (create, share and exchange) of information, ideas and user-generated content. It is common to see the younger generation browsing social media sites, reading blogs or chatting via many online media channels such as Facebook and Twitter. These have opened opportunities for Internet users to use these new media in creating, sharing, collaborating and organising information without border. International communication via social networks is a form of mass communication. This new technology is considered as a game changer of communication. Printing press invented by Gutenberg back in 1400's has facilitated the mass production and use of flyers, brochures and magazines as a means of communication.

The emergence of radio and television in the early 1900 saw a different era of communication growth targeting people and society on a massive scale. The Internet which was initially developed for military use was later commercialized in the early 1990's leading to the growth of online communication. Recent trends in the worldwide saw an uprising of the Internet. Some Asian countries such as Japan and South Korea saw Internet usage percentage exceeds 70% (Czinkota et al., 2013). Traditionally and historically, messages were conveyed via radio, television, newspaper, direct mail and billboards. It helped to reach people. However, these traditional mass media has increased such as in the number of TV/radio channels and newspapers. These have become less appealing to the masses. People tend to be more loyal to a specific station or newspapers that appeal to their interest.

Furthermore, traditional media practices one way communication. Thus the traditional mass media market share has declined and such tendencies prompted organizations to devise a novel communication method to inform the masses at a fraction of traditional media cost.

Table 1.4: Internet and Facebook Users and Penetration of Selected Countries

Countries	Internet Users, (Year 2000)	Internet Users (Jun 2014)	Penetration (% Population)	Facebook (Dec. 2012)
Brunei	30,000	318,900	75.4 %	254,760
Cambodia	6,000	927,500	6 %	742,220
China	22,500,000	642,261,240	47.4 %	633,300
India	5,000,000	243,000,000	19.7 %	62,713,680
Indonesia	2,000,000	71,190,000	28.1 %	51,096,860
Japan	47,080,000	109,626,672	86.2 %	17,196,080
Laos	6,000	850,425	12.5 %	255,880
Malaysia	3,700,000	20,140,125	67 %	13,589,520
Myanmar	1,000	668,955	1.2 %	n/a
Philippines	2,000,000	44,200,540	41.1 %	29,890,900
Singapore	1,200,000	4,453,859	80 %	2,915,640
Thailand	2,300,000	20,100,000	29.7 %	17,721,480
Vietnam	200,000	41,012,186	43.9 %	10,669,880

Note: The Asian Internet Statistics were updated for June 30, 2014. The Facebook subscriber data was updated for December 31, 2012. Source: <http://www.Internetworldstats.com/stats3.html>

The number of global Internet users reached 3.04 billion worldwide, which shows an increment of 741% since 2000 and there were 13.6 million Facebook users in Malaysia (Internet World Stats., 2014). Malaysia is the second South Asean country, trailing behind Singapore with Internet penetration rate of 67% (Internet World Statistics, 2014). In the last few years, use of social media sites, especially in Malaysia has appeared to be significantly progressed. The top five social media sites were Yahoo, Facebook, Google, YouTube and Blogger. Facebook is currently the

most popular and frequently accessed social media website in Malaysia (The Star Online, 2014).

In Malaysia, total Internet users have reached 20.1 million people compared to the year 2000 which only saw 3.7 million users. Social media complements the mass media and they are part and parcel of an individual life, especially now in the 21st century. Social media is now a well-known and common platform to foster relationships; sharing and connecting ideas; and interest among people around the world. It is the place where new ideas are generated, shared and act as the most efficient tool in educating oneself through knowledge attainment.

The society in general is getting more sophisticated and the younger generations prefer non-traditional communication medium as a means for getting news and information. Social media is a broad spectrum and akin to traditional media, but disseminates information to people worldwide via Internet. It takes various forms including blogs, wikis, forums, social network and podcast. In addition, social network sites have grown in popularity worldwide over the past decades. Communication technology such as the Internet and mobile technology facilitates meaningful online interaction among individuals or organization (Czinkota et al., 2013).

Kaplan and Haelein (2010) have defined social media as a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, which allows the creation and exchange of User Generated Content. Social media is seen as revolution in progress overthrowing traditional communication.

Compared to traditional media, social media allows and provide ways for people to participate in discussions, voice their negative or positive opinions on products, services, events or even global issues such as terrorism or the environment.

1.4 The Green Initiatives by the Penang State Government & Local Authorities

Penang is one of the most globalized and cosmopolitan states in Malaysia along with other states such as Selangor and Johor. In addition to that, Penang consistently records high economic growth rates over the years. Looking back at its previous historical function, Penang economic status soared as a favourite trading centre, entry point with container terminal in Butterworth, manufacturing, business process and services as the foremost economic activity presently.

The highly industrialized southern part of Penang Island houses high-tech and modernized electronics, medical devices, etc firms such as Dell, Intel, AMD, Altera, Motorola, Agilent, Osram, Plexus, Bosch, St. Jude and others (UNDP, 2008). Between the years of 2008 to 2013, Penang received approximately 13% of Malaysia's total investment in a form of FDI. Nevertheless, as Penang's economy matures, domestically driven economic activities are expected to become important economic drivers in coming year's (Penang Monthly, 2015). Penang Island is the part of the state on the island that falls under the jurisdiction of Penang Island Municipal Council (MPPP); and part of the state on the mainland under the jurisdiction of the Seberang Perai Municipal Council (MPSP) (UNDP, 2008).

In December 2014, the Penang Island was approved by the Cabinet of Malaysia to be upgraded to city status (The Star, 2014) and been conferred with city status recently. In its effort to become an international and intelligent state, the Penang State Government has launched Cleaner, Greener Penang Initiative and introduced many programmes (No Plastic Bag Every Day, Penang Green School, Penang Green Office, Penang Green Journalism, No Polystyrene at Local Council Hawker Centres and many others). In addition to that, the state is going to introduce Waste Generator Polluters Pay policy as an effort to reduce the discarding of solid waste by industrial factories at the Pulau Burung landfill. The policy which is expected to be enforced in 2015 will see industrial companies bear the cost of their own solid waste generated and pay to the landfill operator (The Star, 2014).

In promoting zero waste, distribution of free plastic shopping bags was banned in the supermarkets and hypermarkets since 2009, and followed by the ban of polystyrene food containers in all eateries in early 2011. The solid waste recycling rate has reached 28% and 34% for MPPP and MPSP respectively. In 2014, Penang achieved a 32% recycling rate which exceeds the country's targeted rate for 2020 (Penang Green Council, 2014). Although the Penang State had achieved the highest recycling rate in the country, the authorities are not complacent. With the recent ruling by the Federal Government, which had announced that mandatory separation at source to (formulated under the Solid Waste Management and Public Cleansing Management Act 2007) be implemented in stages from September 2015 (The Star, 2014), thus is imperative for the state to make the necessary amendments to its bylaw to ensure waste separation at source will be implemented smoothly throughout the state.

1.5 The Role of Non-Governmental Organization (NGO's) in Malaysia

In many countries, the emergence of NGO is seen as a primary actor in the governance of social and economic affair (Lloyd, 2005). Doost (2011) characterises NGO to be independent of the government, thus making them a suitable agent to address social and environmental issues. Based on a survey conducted in the year 2006, NGO sector, especially in developing countries such as India (1 million) and Brazil (2100) have risen significantly (Lloyd, 2005).

Apart from Consumer Association of Penang (CAP), there were numerous other NGO's established since the 80's until present to address various social economic and environmental issues such as Sahabat Alam Malaysia (SAM), Friends of Sungai Juru, Water Watch Penang, Malaysia Nature Society and many more. Malaysian Environmental NGO's (MENGO) an establishment formed in 2002 under the Danish International Development Assistance (DANIDA), is an independent platform comprising of 26 environmental NGO as to date advocating efforts towards environmental sustainability (MENGO, 2015; Hashim et al., 2010).

The role of NGO as an advocator and influencer especially during environmental crisis were undeniable. Particularly in the state of Penang, two major events, Save Penang Hill and the Penang Global City Centre campaign saw NGO's effort in mobilizing massive public awareness campaign of the negative consequences on environment and voice their discontentment to the policy makers to stop the project (Doost, 2011).

1.6 Research Problem

Waste generation continues to increase year after year in tandem with rapid socioeconomic development and population size. Urbanization is expected to continue as a nation develops. In addition to that, an average Malaysian is expected to generate 1 kilogram of solid waste per day (Ministry of Housing and Local Government, 2012). Moreover, government recycling programme is yet to bring in any significant and positive changes as the volume of waste generated is anticipated to increase in future. Likewise to the many regulations, awareness campaigns have yet to lead to a positive change in public's behaviour towards recycling. Landfill and dumps remain as a main waste disposal method in Malaysia (Kathiravela et al., 2009; Tramudi et al., 2012).

In general, attitude found to be positively related to environmental behaviour (Taylor & Todd, 1995). Study by Ramayah et al. (2012) implied attitude has a smaller but significant impact on recycling behaviour among university students in Malaysia. While in Ramayah and Rahbar (2013), actual gain; environmental knowledge and awareness; and perceived value were found to effect attitude and resulted to be positively related to recycling behaviour among university students. It was proposed that policy makers increase communication and education effort in to inculcate positive attitude towards recycling behaviour (Ramayah & Rahbar, 2013). On the contrary, it is somewhat surprising that attitude was found to be insignificantly associated with intention in several studies. Park and Yang (2012) cited attitude not being significant towards environmental activities among online communities considering its contribution towards intention and behaviour. This

indicated that cultural disposition were more predominate compared to attitudinal control. Ajzen and Fishbein (1975) asserted that people in general can be categorized as attitudinal or normatively controlled to which are influenced by dispositional factors such as collective or private self (White et al., 2009).

Social pressure to either perform or not perform behaviour can be termed as subjective norm (Ajzen, 1991 & Davies et al., 2002). Study by Sheppard et al. (1988) showed subjective norm to be the weakest predictor of intention for both TRA and TPB models. Study in the Netherlands found subjective norm had a poor impact on recycling and this could be due to differences in cultural settings and value system (Davies et al., 2002). Park and Yang (2012) too noted subjective norm influences behavioural intention towards environmental activities due to the collectivist culture of the people of China compared to more individualist societies settings such as in western countries where people exhibit independent opinions and decision. This reiterated the findings by Ramayah et al. (2012) in which social pressure greatly impacted the recycling behaviour among university students and Malaysia's collectivism culture enables social pressure to influence the behaviour of Malaysians public in general. On top of this, Siddique et al. (2010) suggests that increasing social pressure via promotional activities aimed at communities and children can indirectly increase recycling effort.

Social influence was cited as an important factor when recycling attitude is weak and it was suggested dissemination of information through varied forms of media is one way to increase recycling behaviour (Huffman et al., 2014). In addition, Park and Yang (2012) acknowledged usage of Internet as an efficient and effective

tool for provoking civic consciousness, participation and mobilizing social actions, such as environmental activities. Doost (2011) highlighted that the important role of Internet that had made environmental movements easier and heard by the people and this was proven in the campaign against Penang Global City Centre in Penang and Save Penang Hill. As suggested, the Internet can disseminate diverse voices and transform those voices into actions when the voices are appealing for social goods that require collective effort (Park & Yang, 2012).

As of 2012, there are approximately 13.6 million Facebook subscribers in Malaysia and thus it could be an excellent forum to communicate recycling messages to the masses and act as medium to influence recycling intention and behaviour. In addition, the role and influence of social media in environmental sustainability has been largely unexploited, particularly in Malaysia. Thus, social media usage is therefore seen as an influencer that enables people to follow a particular behaviour through the interaction with others in the social media platform. The inclusion of social media in this study is to gain better understanding and new perspectives on its influences towards recycling intention and behaviour relationship.

Despite many studies undertaken to discover various constructs that propels or hinders people to recycle, there is still vast room exists covering a variety of causes that could possibly influence recycling behaviour. Intention is the pivotal construct in Theory of Reasoned Action (TRA), Theory of Planned Behaviour (TPB) and Integrated Behavioural Model/Reasoned Action Approach (IBM/RAA) model. In spite of the popularity of TRA and TPB model, much criticism and debate surrounded the nature of intention (Davies et al. 2002) and how well intention

predicts behaviour (Amireault et al., 2008; Sheeran, 2002). A meta-analysis of meta-analysis found that intention accounts for only 28% of variance (on average) in future behaviour (Sheeran, 2002). Fishbein (2000) postulated that it's imperative to recognize that people do not or cannot, always act on their intentions. He further stressed that different communication or interventions are necessary for people who have formed an intention, but are not acting on it either through building skills or removing environmental constraints (Fishbein, 2000).

Sheeran (2002) proposed further studies needed to understand the mechanism underlining the intention and behaviour relationship. Some studies suggested intention has better predictability capability when respondents are inexperienced in performing an intended behaviour, thus other factors must be investigated (Amireault et al., 2008). Thomas and Sharp (2013), in their recent investigation of recycling practices in the United Kingdom, called for further research to be undertaken to seek better understanding of the role of habit, social norms and recycling intervention in the context of recycling. Pakpour et al. (2014) even suggested future research to look into possible behaviour changing intervention and enticing younger generation into recycling behaviour.

Despite the finding that the role of government has no moderating effect on e-waste recycling intention-behaviour (Hui, 2013), however, with impending new regulation, policy on source segregation and media dissemination by policy makers and authorities via social media platform provides a window opportunity for further investigation of the government's role in this area of study. There were many studies called for policy makers for better governance and regulation in waste minimization

(Haron et al., 2006; Saeed et al., 2009; Samsudin & Don, 2013; Abas & Wee, 2014). Hence, in this study, the researcher intends to explore the possible significant moderating effect of the role of government within the context of the relationship between recycling intention and behaviour.

Self-efficacy is termed as one's belief and capability to perform behaviour, even under difficult circumstances. Both self-efficacy and perceived behavioural control (PBC) were seen to be similar (Ajzen, 2002; Fishbein & Ajzen, 2010). Many previous studies found self-efficacy significantly predict recycling intention behaviour (e.g., Chan, 1998; Gamba & Oskamp, 1994; Vining & Ebreo, 1990). In spite of being the strongest predictor of recycling intention among Form Four students in Malaysia (Mahmud & Osman, 2010) and Western Australian (Chan & Bishop, 2013), past studies (Boldero, 1995; Davies et al., 2002) found PBC to be insignificantly related to intention and behaviour.

In other studies, the recycling cost and convenience of available recycling infrastructures was treated as a dimension to PBC and both were found to be insignificant and did not impact recycling behaviour (Ramayah et al., 2012). Fishbein and Ajzen (2010) succinctly explained that people may not have a strong intention to perform a given behaviour if they do not have control of the behaviour despite having a positive attitude and social pressure.

Malaysians cannot simply carry on their wasteful behaviour without affecting the social well-being of future generations to come. Moreover, problem to manage the country's solid waste management is inevitable if there is a continued

lackadaisical behaviour among the public towards recycling. Many Malaysian are aware of recycling but when it comes to practice, it's a sad scenario as the national recycling rate is a meagre 5%. Pappu et al. (2007) reported that extensive recycling effort and use of environmental friendly technology enabled industries in India to recycle solid waste disposal in building components by around 15–20%. Therefore, recycling is seen as a crucial process to lessen the dependency on landfills and dumps as means of waste disposal.

Thus this research set to examine whether Malaysians in general exercises control and capabilities in performing recycling behaviour or need intervention in forms of policies, regulation, etc. Taking into account the limited work on the role of social media, government and NGO in relation to recycling intention and behaviour among the general public, thus this study is aimed to fill in the gap and understand the impact of these factors that could possibly lead or encourage the public to engage in recycling behaviour, in particular among the general public in Penang. Furthermore, the assessment of government and NGO moderating recycling intention behaviour linkage is rare in past literatures. Such undertaking intends to contribute to the literature as there are still some areas lacking of empirical explanation, especially in the Malaysia multi-racial setting. The research will be able to assist the government and NGO's to develop advocacy methods to progressively change public's intention behaviour towards better environmental consciousness and protection.

1.7 Research Objective

The research aims to study the determinants that influence recycling behaviour of the Malaysian public in Penang. Hence it focuses on the following objectives:

- i. To examine the relationship between determinant factors (attitude, social norm, social media usage and self-efficacy) and recycling intention
- ii. To determine if government's and NGO's role moderates the relationship between recycling intention and behaviour
- iii. To examine the impact of intention on recycling behaviour

Through research, factors that influence recycling behaviour among the public can be determined and analysed.

1.8 Research Questions

The study attempts to answer the following question in relation to the above-mentioned objectives:

- i. Is attitude related to individual's intention to recycle?
- ii. Is social norm related to individual's intention to recycle?
- iii. Is social media usage related to individual's intention to recycle?
- iv. Is self-efficacy related to individual's intention to recycle?
- v. Does the role of government moderate the relationship between recycling intention and behaviour?
- vi. Does the role of NGO moderate the relationship between recycling intention and behaviour?
- vii. Is intention positively related to recycling behaviour?

1.9 Significance of the Study

The purpose of this study is to examine the characteristics of recycling behaviour among the Malaysian public in Penang. This study uses IBM/RAA as it is more comprehensive. Though the TPB is confirmed to be a useful model and widely applied in explaining the determinants of recycling intention behaviour, however, Boldera (1995), Davies et al. (2002) and Kaiser (2003) argued that there is some inadequacy of the model and suggested inclusion of additional variables or determinants into the existing model. This corresponded with Ajzen (1991) who had agreed that there identifying various other factors within the TPB context must be given due attention.

Therefore, this research has included the usage of social media as a tool of influence in performing or not performing recycling behaviour and the role of government and NGO as moderators in strengthening the intention behavioural of the public as this is an area needed to be researched upon and relatively lacking although a number of studies on other recycling determinants done in the past. Other contributions of this research will be on the practical context to the policy development. The completion of this research will be of significance and as supplementary evidence to the Malaysian Government, particularly to the Penang State Government, Local Authorities (MBPP and MPSP), Ministry of Natural Resources and Environment (MNRE); and the Local Council Department (JKT) in synchronizing relevant national policies across ministries and agencies; and towards better enforcement by the Local Authorities, namely the Local City and Municipal Councils. Again, it must be noted that there is a lack of research on recycling,

especially on the role of social media in changing people's intention towards recycling behaviour, thus such empirical evidence will likely enrich academic contribution in terms of new knowledge to the existing literatures not just in Malaysia but maybe also in other parts of the world.

1.10 Definitions of Key Terms

This section provides some brief explanation of the key determinants used in this study.

1.10.1 Attitude

Attitude is termed as a function of an individual's beliefs towards a behaviour and subjective evaluation of that behaviour Fishbein and Ajzen (1975).

1.10.2 Social norm

Social norm is defined as shared perception of ideal forms of behaviour to which individuals try to conform (Ostrom, 2000).

1.10.3 Social Media

Kaplan and Haelein (2010) defined social media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content.

1.10.4 Self-efficacy

Self-efficacy is referred to as people's belief in one's capabilities to perform required actions and analysed in terms of perceived ability to perform under various circumstances (Bandura & Cervone, 1989).

1.10.5 Non-Governmental Organization (NGO)

Young (2000) conceptualises NGO is referred to as non-profit entities comprising volunteers and concerned with distinct policy objectives.

1.10.6 Recycling intention

For the past 30 years, both Fishbein and Ajzen (2010) have advocated that a given behaviour can be predicted by a small number of variables and behaviour intention being the most vital antecedent of behaviour. The founders of TRA/TPB/IBM/RAA models further explained that behaviour intention can be represented as readiness or probability to perform a particular behaviour, as in relation to this study, recycling.

1.10.7 Recycling behaviour

Recycling is generally is a behaviour that requires individual's effort to sort, prepare and store household waste (Tonglet et al., 2004). Meanwhile, recent work by Mani and Cova (2014) referred recycling as an act to voluntarily reduce waste like transforming the usefulness of the object or extending the product life.

1.11 Organization of the report

This research is divided into five chapters as follows:

Chapter 1: Introduction – this chapter provides an overview of recycling activities in Malaysia and the impact of social media in social economic development. The chapter also encompasses research problem, research objectives and questions, significance of the study and definitions of key variables.

Chapter 2: Literature Review – encompasses of literature by previous researchers of the variables used in this research that forms the research/theoretical framework. It consists of past and recent studies related to the construct and provides connection and insight to the topic being studied. The chapter also outlines the research hypotheses.

Chapter 3: Research Methodology – presents the research methodology used to collect and analyse data and information gathered in relation to this study. It includes population and sample, unit of analysis, data collection method, and the output of the statistical that will assist the researcher to answer the research questions and achieve research objective established in Chapter 1.

Chapter 4: Data Analysis and Findings– this constitutes the major component of the dissertation. This will provide the key insights and findings, which were gained by the researcher after being engaged with the research methodology which has been proposed earlier. It is expected as well that this section will be useful for the potential users of the study as it outlines the outcomes of the investigation.