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GOVERNMENT INITIATIVES AND PUBLIC AWARENESS ON SUSTAINABLE ENVIRONMENT

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Abstract: *Level of awareness of recycling activities is important to the sustainability of our environment. Recycling awareness among households is critical as most of the solid waste is from household consumption. Although the government has tried to adequately equip households with knowledge and know-how to manage solid household waste through the different kind of environmental preservation programs, households knowledge on recycling is still inadequate. Hence, this study is carried out to address the above-mentioned issue by examining the level of awareness of recycling activities initiated by the government. The study employs a quantitative research approach in which 438 questionnaires are collected among residents in the residential areas of Selangor in 2018. The findings suggest households' level of awareness on recycling activities is at a moderate level, as shown, 66% claim that they have knowledge on recycling activities initiated by the government and 16% claim that they have high level of awareness and while the balance of 18% shows low level of awareness on government initiatives. It is expected that these findings will be beneficial to the local municipal councils to regulate a more effective and significant program on recycling campaign so that householders will have high awareness and lead towards better participation in recycling.*

Keywords: *Sustainable Environment, Recycling Behavior, Level of Awareness, Government Initiatives*

Introduction

Environment sustainability is an emphasis given towards conservation and enhancement of the resource base and emerging economic growth. To be specific, sustainable environment is the rate at which renewable resources harvested and non-renewable resource depletion can be continued indefinitely. It has been argued that the government has in place various plans and initiatives since 1988 (Table 1) and it is believed that this could significantly contribute towards preserving the environment (Agamuthu & Dennis, 2011; Abas & Seow, 2014 & Sreenivasan, Govindan, Chinnsami & Kadiresu, 2012). However due to low level of awareness; it has been difficult to successfully manage recycling behavior among households.

Increasing population and the pursuits of modern lifestyles are among the major causes of solid waste accumulation in Malaysia. Malaysia is facing problems with rapid growth of domestic waste which is generated from households (Afroz, Masud, Akhtar & Duasa, 2013). Budhiarta et al. (2011), reported that an average per-capita generation of municipal waste is about 0.85 kg/person/day in Malaysia and specifically about 1.5kg/person/day in Kuala Lumpur. In line with that, the Malaysian government through its local municipal councils has implemented various policies and programs to enhance household participation in separating their domestic waste. This is important because the success of the waste separation program comes from good separation behavior and practices among households.

Overview Of Solid Waste Management In Developing Countries

In fact, developing countries in Asia is still backwards on issues of waste recycling as there is not much awareness of waste recycling and also ineffective policies. In many developing countries of Asia, solid wastes contain around 50% organic matters and 30% recyclable materials on average, leading to a potential of recycling 80% of the total wastes. Developing countries tend to recycle not for the act of altruism but for economic reasons while residents from developed countries being more educated, they recycle due to environmental consciousness and intrinsic believe that a clean environment is worthy activities. Recycling has become a way of life in developed countries and they have greatly accepted the policy of 'pay-for what -you throw-away program". Hence, this resulted in a higher recycling rate due to policies and logistics that are user friendly. In addition, informal sectors do play a major role in waste recycling in developing countries in Asia due to the high level of poverty. It can be observed that recycling activities is gradually being embraced by developing countries in Asia as it can help to reduce the disposal cost for local authorities, reducing vehicle maintenance and economic benefits (Jereme, Siwar & Alam, 2015).

Between 1997 and 2011, the Taiwanese government was able to slash daily household waste accumulation from 1.14 kg to a mere 0.43 kg. Over that same period, the national recycling rate exploded from 5.87 percent to more than 60 percent, making Taiwan one of the world's top recyclers and a leader in pro-environment policy for the Asia Pacific (Taiwan's Recycling Boom, 2013). Other countries such as Korea and Japan has have cultivated successful public recycling behaviors through unorthodox measures. For example, in South Korea it is mandatory for food waste to be separated by households so it can be recycled into animal feed or compost. There are also high-tech food waste disposal systems that weigh the food waste and charge residents based on the weight of disposed food waste. The country managed to cut its food waste from 5.1 million tons in 2008 to 4.8 million tons in 2014, official statistics show. However, in Singapore, a study found that the households recycled was just 19 percent of their waste in 2015, down from 22 percent in 2010. It is believed that it was due to lack of awareness

and indifference that explains the absence of recycling habits even with the efficient government supporting the recycling. Singapore has long relied on a network of rag-and-bone men, who go from door-to-door in housing estates and paying the residents by weight for newspapers, used clothing or electronics waste, which they then sell to specialized markets or junkyards (Sile, A. W. (2016, 14th November).

There are about 593 districts and 5000 towns in India. Approximate 27.8 percent of the total population of more than 1 billion lives in urban areas and projected this urban population will increase to 33.4 percent by year 2026. The quantum of waste generated in Indian cities has increased about 4.25 percent annually and is expected to increase to 300 million tons by 2047 due to the urbanisation and fast adoption of 'use & throw concept which contains more non-biodegradable components like plastics and packaging. Even though various initiatives and policies had taken by the government, private companies and corporations by providing solutions and facilitates the disposal in India. However, due to lack of collection and segregation at source, scarcity of land, dumping of e-waste, lack of awareness and cannot mobilize financial resources for applying expensive technology has post significant challenges in improving waste management in India (Agarwal, Chaudhary & Singh, 2015).

Due to rapid economic growth and population increase, the environmental pollution, climate change and resource depletion have become significantly serious in China. The Chinese government begun to regulate and promote source separation and urban waste recycling since 2006, covering 90 cities, 51,550 sites, 341 collection centers, 63 terminal markets and 123 recycling and processing bases. The recycling in 2016 reached 246 million tons with 0.3 percent increase from the previous year. However, the result is not up to the expectation due to ineffective governance and market construction; inefficient source of separation and lack of recycling information platform (Xiao, Dong, Geng & Brander, 2018).

Solid Waste In Malaysia

Since Malaysia is moving towards industrialised nations, these wastes are tense and potentially change the composition of content and uncontrolled dumping which is widespread due to rapid urbanisation and shortage of landfill. In fact, separation of household wastes is unpopular in developing countries including Malaysia because of the negative perception of waste handling. Hence, the absence of separation of solid wastes at source increase inefficiency in the recycling cycle and wastes material become contaminated and dispersed (Jereme et. al., 2015).

Due to the failure experienced in the first program in 1988. To encourage public participation in the second recycling programme, the Malaysia Housing and Local Government (MHLG) had engaged one of the local public relation company in the city to carry out productions of pamphlets, posters and billboards, commercial advertisement, and recycling song to spice up the occasion. Many buy-back centres was established in the major cities of Malaysia for easy deposition of recycling materials. In addition to this, 29 participants in Peninsular Malaysia have been selected based on their volume of waste generated were provided with special drop-of containers for recyclables and these containers will be placed at strategic locations of the municipalities (Jereme, Siwar & Alam, 2015). In fact, the Malaysian government has introduce compulsory waste segregation in June, 2016. Penalties for residents who do not comply include fines of up to 500 Malaysian ringgit (Sile, A. W. (2016, 14th November). However, it were not implemented effectively.

The Solid Waste Management and Public Cleanliness Corporation (SWCorp) has launched Separation at Source Initiatives (SSI) on September 2015 to foster good environment practices

among households. Booklets and posters with information on categories of recyclable items and steps showing how to manage their solid waste correctly were distributed to households to prompt awareness on solid waste management. Aside from this implementation, Zainua and Songip (2017) stated that municipal waste recycling in Malaysia is still far behind compared to other developed countries. In fact, the level of awareness among Malaysian in reducing household waste through recycling behavior is still low and it is at a rate of only 17.5% in the year 2017 (SWCrop). However, the government's target of increasing the nation's recycling rate to 22% and 100% urban source separation rate by 2020, would require a drastic transformation in habits and attitudes of the Malaysian public (Omran, Mahmood, Abdul Aziz & Robbinson, 2009; Agamuthu & Dannis, 2011).

In light of the discussion above, this paper attempts to examine the level of awareness among households in Selangor on recycling programs initiated by the Malaysian Government. The reason is because, the lifestyles in the urban areas have steered serious waste problem in Malaysia, and therefore there is a need to analyze the current level of awareness towards recycling so that the government and NGOs can successfully implement environmental related projects and to strategize ways to convince households to engage with recycling programs.

Table 1: Policy Evolution Of Solid Waste Management In Malaysia

Plan / year	Action	Aim / objective	Achievement
Beautiful and Clean Malaysia (ABC) 1988	Ministry of Housing and Local Government (MHLG)	Produce a national uniform municipal solid waste system that was productive, environmentally sound and socially acceptable in Malaysia by the year 2010.	Policy was not officially endorsed by the National Council for Local Government implementation
National Strategic Plan for Solid Waste Management in Malaysia (NSP) /2002	Adopted in 2005 by the Government of Malaysia - proposed six strategies to guide solid waste legislative, institutional and infrastructural planning and management in Malaysia including an Action Plan	Target of 22% for reduction and recovery, and a target of 100% for urban source separation by 2020	Provide framework for the development of the SWM Legislation, Master Plans, Waste Minimization and the SWM Facilities Master Plans
Master Plan on National Waste Minimization (MWM) / 2006	Outlined the detail guidelines and policy for waste minimization strategies, action plans for Federal Government, local authorities and pilot projects on waste minimizations	Provide Vision, Strategies and Roles of Stakeholders to minimize the amount of solid waste disposed in Malaysia. Targets is to achieve 11% recycling rate in 2010.	Not achieving
National Solid Waste Management Policy	Outlined the detail and policy documentation for waste Minimization	Establishing an integrated & comprehensive solid waste management which is cost effective, sustainable &	Provisions & the implementation of Policy through the hierarchy &

(NSWMP/2006)		accepted by the public, emphasizes on environmental & public health protection, selective of affordable technologies.	emphasis on waste reduction through 3R activities, intermediate treatment and final disposal.
Solid Waste and Public Cleansing Management Act (SWPCM/ 2007)	Regulates the management of solid waste and public cleansing to ensure the maintenance of proper sanitation in Peninsular Malaysia and the Federal Territories of Putrajaya and Labuan.	Controlled solid waste to denote the source and defines solid waste as scrap, unwanted surplus substance or rejected products arising from the application of any process but excludes scheduled waste, sewage and radioactive waste	Gazetted on 30th August 2007 and has not been enforced due to a lack of supporting regulations
SWM Corporation Strategic Plan (SP / 2009-2013)	To recommend and implement policies, plans and strategies including schemes for SWM. Identified seven focus areas which includes public awareness programme, monitoring services, financial management, HR & environment sustainability, ICT to meet customer needs.	Aims to achieve an increase in 3R awareness of 30%, a recycling target of 40% and the implementation of a deposit refund system of at least 30 firms by 2013	Yet to be implemented (2011).
Tenth Malaysian Plan (10MP) / 2011-2015	Provisions for 3R and includes aspects of Extended Producer Responsibility (EPR) such as take back system for producers & deposit refund system	To stimulate the national economy to achieve economic growth and investment	Unclear outcome

Source: Agamuthu & Dennis (2011)

Literature Review

Two points will be discussed in literature review, recycling behaviour and awareness of the government initiative in recycling.

Recycling Behavior

Consumers' knowledge is recognized in consumer research as a characteristic that influences all phases in the decision process. Specifically, knowledge is a relevant and significant construct that affects how consumers gather and organize information (Alba and Hutchinson, 1987), how much information is used in decision making (Brucks, 1985) and how consumers evaluate products and services (Murray and Schlacter, 1990). According to Kaplan and Rogghe (1991), the state of one's knowledge about an issue impacts significantly upon decision making. Specifically, people dislike, and thus tend to avoid situations where they have insufficient knowledge to guide their behavior and where the possibility of confusion is great (Kearney & DeYoung, 1995). The above discussion explains why some people may choose not to adopt recycling activities because they feel that they do not know enough about

recycling. Furthermore, the importance of knowledge and the impact of lack of knowledge in the decision-making process have been demonstrated in numerous studies. In a study of recyclers and non-recyclers, it was concluded that the attitudes or motives of the two groups were not that different, but there was a significant difference in their operational knowledge. Thus, confusion about the process of recycling was associated with no recycling behavior. In addition, studies have shown that knowledge generally influences pro environmental attitudes, which in turn motivate environmentally responsible consumer behavior (Kollmuss, & Agyeman, 2002; Zsoka, Szerenyi, Szechy, & Kocsis, 2013). Similarly, Ibrahim (1999), concluded that information and knowledge about recycling were both significant predictors of recycling behavior. Jekria and Daud (2016) believe that, people who are concerned about environment issues tend to have positive attitudes towards recycling behaviour.

Empirical support for the influence of consumers' recycling knowledge on their household recycling behavior is contradictory. Knowledge of people on environment in general has long been recognized as among the most crucial factors influencing recycling (Nixon and Saphores, 2009, Burn and Osakamp 1986). This is further supported by Babaei et al. (2015) which have shown that recycling knowledge is a significant predictor of household recycling behavior. Therefore, a good recycling knowledge should supposedly able to increase the level of awareness, and thus, leads to a high participation on recycling activities.

Awareness

Generally, awareness is relating to a situation which often label as situation awareness. According to Endsley (1995), situation awareness is informally and intuitively described as "knowing what's going on" and, more formally, as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future". There are three levels of situation awareness (SA) namely, perception (including "noticing"), comprehension, and projection. In the context of recycling behavior, situation awareness has a crucial role to play. Recycling awareness is important to overcome environmental problem and it is a significant contributor to sustainable environment. Household should be more concern about this because they use a lot of product that are recyclable such as plastics, paper, boxes, and glasses and electronic.

Furthermore, the lack of awareness towards recycling will be a problem to the earth in 10-20 years to come. As past researchers have reported that the level of awareness is low, so the trend to recycle among households will definitely be low. As such, it is very important to investigate the level of awareness among the households which will affect their behavior towards the environment. With reference to Endsley's (2017) approach of situation awareness, high level of awareness depends on the success of lower levels. For this research, researchers have identified three level of awareness, which are low, moderate and high. When the household possess low level of awareness, most likely the recycling behavior will be low and may results in the increase of illegal disposal.

Afroz and Masud, (2010) conducted a research in Kuala Lumpur to examine the public perception of local environment quality, awareness and environmental performance and their willingness to pay for improving waste management. The findings reveal that the level of awareness of the households about the negative impact of improper waste management is low in Malaysia compared to other developed countries of the world. In such situation, there is an urgent need to examine the current state of awareness of the public on recycling activities as the government has put in more efforts into proper waste management.

Background Of The Respondents

This section describes the background of the respondents from Selangor totalling 438 and collected during May – August, 2018.

Table 2: Background Of Respondent

Variables	Frequency	Percent (%)
Gender		
Male	152	34.7
Female	286	65.3
Age Group		
< 25 years	0	0
25-34 years	46	10.5
35-44 years	218	49.7
45-54 years	154	35.2
> 55 years	20	4.6
Ethnicity		
Malay	178	40.6
Chinese	143	32.6
Indian	98	22.4
Others	19	4.4
Type of Residence		
Owner	375	85.6
Tenant	63	14.4

Source: Develop For Research

Among the total respondents of 438, the descriptive analysis in Table 2 showed the gender distribution of males and females, in which males constitute 34.7% (152) and females 65.3% (286). This indicates that females are the majority in the field of study. The ages of the respondents ranged between 25 to 67 years. In this regard, the descriptive analysis in Table 2 showed that the age group of between 25 – 34 years old were 10.5% (46), 35 – 44 years old were 49.7% (218), and 45 – 54 years old were 35.2% (154). This indicated that the respondents in that age category of 35 to 44 were more than the other age levels. With regard to the respondents' ethnicity, the distribution is 40.6% (178) are Malays, 32.6 % (143) are Chinese, 22.4% (98) are Indians and 4.4% (19) are those who fall under the category of others. The results also indicated that majority of the respondents, which is 85.6% (375) are owners themselves while the rest 14.4% (63) are tenants.

Results

By adapting to Endsley (2017)'s situation awareness, a descriptive statistic based on frequency was performed in order to assess the level of awareness among the households on the government recycling initiative. The results reviewed that 66 % of the respondents are moderately aware about the recycling initiatives while, 18% of the respondents indicated low level of awareness in responded to government initiatives. Only 16% of the respondents exhibited high level of awareness towards government recycling initiatives.

The findings sum up that the maximum number of respondents (82%) is aware of the government programs on recycling activities. Thus, majority of the households in Selangor

have awareness on recycling activities and knew that recycling is important to preserve the environment and its resources. Furthermore, the analysis on the level of awareness indicates that majority of the households in Selangor have received sufficient information on government initiates on recycling programs as well as the benefits of recycling towards the environment.

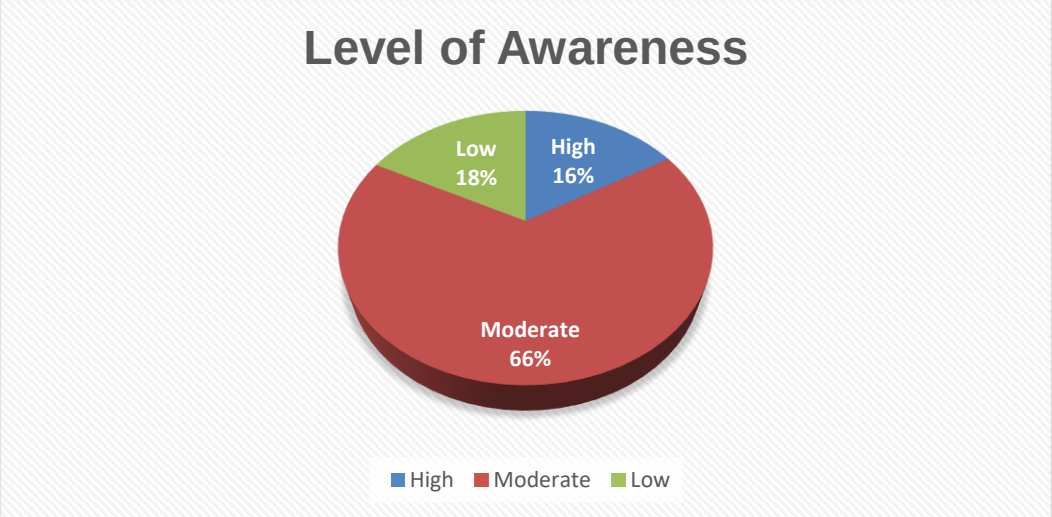

Figure 1: Level of Recycling Awareness Among Households In Selangor
Sources: Develop For Research

Conclusions And Recommendation

This study attempts to assess the level of recycling awareness among households in the state of Selangor, Malaysia. The overall findings revealed that the level of recycling awareness on government initiatives and programs on recycling is at a moderate state. Despite having proper guidelines on recycling programs provided by the National Solid Waste Management Department for local authorities, the level of enforcement has failed to achieve its target. It is clear that, the success of recycling not only depends on the awareness level but it is also very much related to attitude (Ramayah, 2012). Guerrero, Maas & Hogland (2013) found that inefficiency of the system such as lack of the equipment and infrastructure influences individual's behavior towards recycling.

The results of the study would be a useful indicator to change agents, specifically the government. The government could educate and cultivate a culture of recycling among its citizen. It is not enough by just carrying our programs to enhance awareness, but what is important is to induce high level of participation on recycling activities. The relevant institutions should strategize in spreading information on the availability of recycling facilities, as well as the perks of recycling programs. This can be done in many ways, for instance, through leaflet distributions in the neighborhoods, or even by embedding the recycling programs into their residential community events, using available media such as televisions and radio networks, billboards, newspapers and magazines, and publicize it on busses, train stations and LRTs. By doing so, households will not only be informed continuously about recycling benefits but also to encourage them and the ways to recycle. This may lead to a major participation on recycling programs, and hence it is believed that the authorities will be able to tackle the poor recycling rates and waste management in the country.

One of the most serious problems that hinders the success of a recycling program in Malaysia is the shallow regulations and guidelines. Alias, Abd Manaf, Ariffin & Abdullah (2018)

commented that there is a serious gap in terms of the existing policies, guidelines, and standards set by the government due to the broad definition of solid waste. This would only create more confusion among the householders even if they wanted to practice recycling. Thus, the government should set more definite and clearer definition of solid waste so that the householders will have a better picture of the recyclable items. In addition, national, state and local authorities should formulate regulations, policies and programs that are sustainable such as barter system or trade-in with some incentives in return. Different types of recycle bins should be provided to household to ease the process of waste separation. Additionally, convenient access to public recycle bins should be provided and the authorities should make it mandatory for each neighborhood to have a notice board that notifies the schedule of waste/recycle collections.

Penalty or fees should be imposed to those industries that are directly or indirectly contaminating the environment such as restaurant business and packaging industry. Restaurant should do a proper forecasting of their sales and customer needs in order to minimize wastage, educate or even fine their customers that for leftover food. The packaging industry should rethink how to minimize the packaging materials used by increasing the size or reducing the quantity in a bottle/pack such as 2000ml of shampoo instead of 200mlx10, or a package of 600g per unit of coffee/peanut instead of 20gx30 in a unit. The innovation in the packaging industry may even consider using safe-to-consume packaging whereby the package itself is edible or it can be used as a fertilizer. Alternatively, the retailers or manufacturers should introduce marketing programs such as redemption of vouchers from the recyclable and to use it for the next purchase. Finally, all the manufacturers should be responsible and rethink about their product design, during the process and the disposal stage of product life cycle which directly will reduce solid waste in the environment.

Direction For The Future

Even though many policies and plan initiated by the government in environment sustainability since 1988, the achievement was unclear until today. High awareness of policies and initiative, determinants, benefits may have little impact in changing the recycling behaviour of society if the formulation, execution and evaluations is improper. Wan, Shen & Choi (2018) found that political factor is the strongest factor that influence recycling policy support and affecting the recycling behaviour of the society. Thus, the policy-makers should form a team, put more effort in formulating a fair, responsive recycling policy and stressed on public participation especially during the policy formulation stage for mobilizing greater public support. Thus, researchers in future should plan, observed, measure and evaluate each of the new plan or policy initiated by the government by introducing some specific tools, measurement, and measured the achievement progressively on interim and yearly basis. Then the result should be made known to the public for feedback as the voice of the public is important in implementing a fairer and responsive policy that affects them.

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