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Socioeconomic Factors in Recycling Waste as a Sustainable Practice in Malaysia

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Abstract

Recycling and waste management is a vital step for a country to ensure the safety and the adequacy space of a country. Recent years, this issue has become a spotlight issues for all countries because if the waste is not separated properly, disorder will occur in landfills, resulting in toxic soup at the bottom, which can contaminate ground water and release explosive methane gas. This paper outlines the issues and challenges in recycling practices in Malaysia, since there is a serious problem of increasing rates of solid waste with corresponding inadequacy of landfills available. Evidence has shown that Malaysia has a low rate of recycling of waste as compared to developed countries. Furthermore, this paper gives an overview of recycling practices with several initiatives conducted by the Malaysian government apart from the socioeconomic factors for waste management in Malaysia. The results of this paper would be able to provide insights to the policy makers in introducing appropriate awareness campaign to the respective targeted group communities.

Keywords

Recycling Practices, Waste Management, Socioeconomic

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1. Introduction

Malaysia is facing a crisis in solid waste management due to rapid development, urbanization and high density in population especially for urban areas in the country. Evidence shows that public participation in recycling of waste materials is low despite several initiatives by the government. Therefore, recycling as an activity is yet to become a universal way of life in Malaysia. For example, over 100 million tons of solid waste can be recycled annually but instead they are discarded and land-filled. Malaysia as a country has spent RM37.4 million to collect and dispose of urban rubbish in the 1990s [16]. Statistics show that a small amount of solid waste generated in Malaysia is recycled; which is far below the rate of 15% to 40% in developed countries. Currently, much of the waste is either land-filled or incinerated but with severe implications for the environment and human wealth. As for recycling, a mere 2% of solid waste generated in Malaysia was recycled with the remainder ending up at landfills. This rate is far below as compared to developed countries such as Switzerland (22%), Denmark (19%), Germany (16%), Netherlands (16%) and Finland (15%) as reported by [26]. Even in comparison with a neighboring country, Singapore's recycling rate is higher at 40% with a 50% target [26]. Refer to Table 1 below:

Table 1. Recycling percentage for some countries.

Countries	Percentage
Switzerland	22
Denmark	19
Germany	16
Netherlands	16
Finland	15
Singapore	40

Source: [26]

These initiatives include a recent ruling to all households in

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Malaysia for separating household organic and inorganic waste into separate bins as effective on September 15, 2015 [22]. The benefit of this is to reduce the problem of the amount of solid waste sent to waste disposal sites such as landfills. If the problem is solved, this will increase the lifespan of such landfills. A brief literature in the context of recycling as a strategy is included. This paper concludes with a research intent on the extent of readiness from the perspective of individual household unit's and some policy contributions.

International trends reflect that incineration and recycling being particularly popular in densely populated countries such as Japan and the Netherlands. However, the cost of construction, procurement and operation of an incinerator is exorbitant. Therefore, it is vital for Malaysia to consider adopting a feasible and cost-effective approach to the waste problem that is safe and economical with minimum damage done to the environment. Furthermore, recycling requires high participation from the public especially in recycling household waste and consumers tend to misuse the recycling bin as it has been reported that over 80% of the 2400 recycling bins nationwide has been misused. Consumers are throwing rubbish regardless of location of waste bins and irrespective of whether items can be recycled or not [8]. Therefore, improving public awareness for protecting the environment via recycling is one major step to be achieved. It would be a significant step in making recycling a lifestyle of choice among Malaysian households. Household participation in recycling is considered low despite many rigorous public campaigns conducted by the government. Households in Ghana did separate their waste effectively averaging 80%. However, in terms of separating into the bin marked biodegradables, 84% effectiveness was obtained whiles 76% effectiveness for sorting into the bin labeled other waste was achieved [14].

Based on recycling practices in Malaysia, an average Malaysian produced 800 grams of solid waste per day while those in urban areas produce 450gm of waste in addition to that of the daily average. There are 30,000 to 33,000 tons of wastes being produced each day last year, compared with 22,000 tons of solid waste produced per day in year 2012. This shows an upward trend of waste being produced in tandem with population growth in the country. The Malaysian government has announced that it is mandatory for Malaysian households to separate household waste according to categories to be effective by September 2015 [24].

According to the Urban Wellbeing, Housing and Local Government Ministry, this mandatory move will see household solid waste be separated in several categories such as plastics, paper, cardboard, glass, metal, food, lump waste and farm waste. Each household will need to provide for two rubbish bins to separate organic from inorganic waste. Any failure by households to separate waste into the correct bins will result in uncollected rubbish.

Moreover, there is a need for the National Solid Waste Management Department to launch public campaigns in improving public awareness and in educating the public nationwide. The public needs to be better informed because then only can attitudes change to result in a change of habits in the context of disposing of household waste materials. Besides educating the public, the government needs to give reassurance and take actions that solid waste management facilities and operating centres be upgraded to ensure the success of improving the rates of recycling among Malaysian households. The implementation of this new ruling on separating organic and inorganic household waste is an initiative by the government to reduce the problem of the amount of solid waste sent to waste disposal sites. The current landfill sites are considered inadequate currently to accommodate to the corresponding increase of waste in the country. The separation of waste will help reduce the amount of solid waste sent to these disposal sites which will then increase the lifespan of these sites.

Households are the main primary source of municipal solid waste in Malaysia. Household waste consists of recyclable materials of 70% to 80% of the total waste composition found in the landfills. A thorough review on existing household solid waste recycling policies and status in Malaysia is relevant in improving solid waste management especially from the context of recycling. Despite the potential opportunities for solid waste recycling, wastes are being dumped in open areas without much attempt for recovery and recycling. When comparing recycling rates of neighboring countries, Malaysia has a recycling rate of 5% showing that recycling as a practice is an uncommon activity. The Government is committed to significantly improve the national's, solid waste management services especially in waste minimization with emphasis on recycling as a sustainable waste management strategy. There has been a shift in paradigm in government policy implementation whereby waste separation and recycling are the major changes. Therefore, this section on issues and challenges in recycling are highlighted. Issues such as information availability and other loopholes in solid waste management such as related recycling community based-programs, the question arises on whether the goals in year 2020 can be met remains unsure. However, there is a possibility for a successful implementation of sustainable solid, waste management particularly in recycling.

2. Literature

[17] argued that recycling is beneficial as it minimizes the use of new resources and energy, reduces air and water pollution and saves sanitary landfill space. [16] states that the benefits of recycling (i) reduces waste which in turn reduces the need for landfill and dumpsites (ii) reduces pollution and saves energy (iii) cheaper in the long-run compare with maintaining landfills and other systems (iv) creates up to 5 times more jobs than waste disposal alone (v) improves cleanliness and quality of life.

Environmental awareness has been escalating among households where recycling take place on an increasing scale and in almost every nation [4] in the world. According to [10], people choose to participate in recycling for a variety of reasons. Recycling behavior is usually associated with defining the characteristics of the "recycler" and "non-recycler" [2]. There are many studies that investigate the motivating reasons behind the people's recycling behaviors. According to [19], personal matters such as attitude, knowledge, demographic variables and personality variables were identified in many studies.

It is essential to ensure that future efforts to enhance recycling schemes are effective and significant; thus, it is important to build up an understanding of the common characteristics of participants. Meanwhile, based on study by [5], knowledge is the body of facts and principles concerning environmental and recycling issues that have been accumulated by mankind through learning. The relationship between environmental knowledge and recycling has frequently been confirmed [3]. This means that is people have environmental knowledge they will have a higher probability to recycle.

Nevertheless, a study by [20], participants that most often express social and civil duty as their values to sort-out garbage and to be a "good citizen" will have a higher probability to recycle. Secondly, a person who has strong environmental values is identified as the most important motive for recycling behavior [6, 12, 18]. In Malaysia, even though, awareness of recycling is high among Malaysians with 82% but very few people practice recycling for various reasons [16]

Recycling requires efforts from the public in terms of investment of time, space, money and effort. Therefore, making recycling convenient should increase household participation in recycling as a practice. This is affirmed by a study done by [7] reported that convenience is an important driver of recycling behaviour. Another study done by [23] concluded that non-recyclers were deterred by the inconvenience and the costs associated with recycling. Meanwhile, [13] meta-analysis study concluded that frequency of recyclables collection was a strong predictor of recycling behaviour. [9] examined selective waste collection systems that are frequently used in Europe and America and conclude that a system that requires less time and effort to dispose and separate waste will result in a higher recycling rate.

[8] found that people who have great concern for the environment are more likely to recycle. [15] studied the distribution of recycling tasks within the household, and report that household members with positive attitudes towards ecology and who are motivated to protect the environment shared a greater burden of the recycling. However, [26] found that concern for the environment was indiscriminately expressed by both recyclers and non-recyclers. Similarly, [18] did not find significant differences between recyclers and non-recyclers in their general pro-ecological attitudes and beliefs in the seriousness of environmental problems. Hence, this literature shows that even though people may be environmentally aware, but it does not necessarily mean that they will undertake recycling activities.

3. Methodology

A total sample of 320 was collected among the households in Malaysia and the respondents are selected randomly in several states, namely; Selangor, Wilayah Persekutuan, Negeri Sembilan and Melaka. These states were chosen in this study because these states are in the waste segregation and recycling programme starting year 2016. The questionnaire would be used together with information on the general characteristics of the respondents such as age, income, education and nationality. In order to obtain the nearest accurate feedback from the residents, there will be a "time-to-think break" for approximately 5 minutes for the respondents to provide their feedback. The complexity and subjectivity of recycling programme has resulted various changes in the benefits to the community. This programme will affect approximately 250,000 households and seventy six percent of them comply and accept this programme in a relatively positive perspective.

The questionnaire is categorised into three sections. First, the introductory script used by the interviewer to identify and initiate contact with the respondents. During the interview, only respondents with age 18 years and above are selected. The interviewer will introduce himself/herself, the purpose and objectives of the survey and how the respondent is selected. Lastly, the interviewer will explain the potentials and threats faced by the community on the impact of recycling and waste segregation.

Section 1 – Introduction

Brief history of waste segregation and recycling

Purpose of this study.

Knowledge and values of waste segregation and recycling to the community

Section 2- Respondents' socioeconomic background

Gender

Age

Education Level

Income Level

Nationality

Section 3- Behavioral and attitudinal information

Behavioral questions: Respondents knowledge and awareness of the

Recycling and waste segregation programme

Attitudinal questions: Views on recycling and waste segregation management

4. Results and Discussions

A summary of the socio-economic profile of respondents is presented in Table 2. The total number of respondents is 320. The respondents' age is between 18 years old to 78 years old, with a mean of 42 years old.

Table 2. Socio-economic Profile of the Respondents.

	Frequency Number	Percentage (%)	Mean
Age (years)			42
Income per annum			RM16270.94
Gender			
Male	124	38.8	
Female	196	61.2	
Race			
Malay	112	35	
Chinese	151	47.2	
Indian	40	12.5	
Others	17	5.3	
Nationality			
Malaysian	260	81.2	
Others	60	18.8	
Marital Status			
Single	188	58.8	
Married	130	40.6	
Others	2	0.6	
Education Level			
Secondary	36	11.2	
Certificate/Diploma	112	35	
Degree and above	172	53.8	

The distributions of the sampled respondents' gender are 38.8.1% and 61.2% male and female respectively. Nationality classification of the respondents shows that majority of the respondents are Malaysian 81.2% and 318.8% are foreigners. Out of the 81.2% Malaysian respondents, most of them are Chinese with 47.2%, 35% are Malay, 12.5% are Indians and 5.3% are others (eg. Punjab, orang asli etc). Meanwhile, 11.2% of the respondents had completed their secondary school, 35% with a certificate/diploma and most of the respondents, 53.8% of them had degree and above qualification. As for the marital status, 58.8% of them are currently single, 40.6% of them are married and 0.6% of them are widowed/ divorced etc.

When respondents were asked about their familiarity with waste segregation management issues, 40.6% of them are not very familiar, 33.4% of them are somewhat familiar, 18.4% are very familiar, and 24% are not familiar with waste segregation management issues. This shows that most respondents in this study are not very familiar with waste management policies. Refer to Table 3 for the results.

Table 3. Respondents' Perception towards familiarity with recycling and waste segregation issues.

Response	Frequency	Percentage (%)
Very familiar	59	18.4
Somewhat familiar	107	33.4
Not very familiar	130	40.6
Not familiar at all	24	7.6
Total	320	100.0

Table 4. Coefficients Regression.

Coefficients	Standard Error
Constant	1.7
Gender	0.475
Race	0.280
Nationality	0.593
Age	0.441**
Marital Status	0.528
Income	0.265***
Education Level	0.345**

***Significant level at 1%,**5% and *10%

Table 4 presents the final regression result for this study. The final model highlights the significant variables in the analysis. Socioeconomic variables that are significant on the waste segregation management practices are age, income and education level. Middle-aged respondents with higher education level as well as higher income tend to have higher awareness and obligation to recycling and waste segregation programme by the state. This result reflected that respondents with higher education have better knowledge on the importance and hence have higher willingness to oblige to the programme. Other than that, higher education level usually leads to higher pay; hence the results also show that higher income respondents tend to be more receptive to recycling and waste segregation programme.

5. Conclusion

The research intent based on the background of study, issues and challenges and brief literature is to examine the preposition of the extent of individual household readiness for waste recycling as a sustainable practice in Malaysia. It is hoped that the findings of this study will give insights into behaviors of individual Malaysian consumers in relation to mandatory recycling imposed effective September 2015. This will enhance the formulation and development of further governmental policies in recycling in the context of waste management. Theoretically, this paper could give a glimpse of the background of recycling and waste management and can lead to further academic studies to contribute to this field of study.

One of the solutions proposed is to adopt drop-off recycling centres as a component of a recycling program. A drop-off recycling is where designated sites are established to collect a range of recyclables. This approach is less costly to operate as they are able to save on labour and transportation costs because these costs are transferred to the recyclers. One vital issue that needs to be addressed is the awareness and knowledge of the public/ people on the importance of recycling as well as how to move about it. Most times, once the public is aware if its importance, they are willing to cooperate and participate in the activities and this can ensure a higher rate of success of recycling practices. Awareness programmes on recycling needs to be able to provide adequate and appropriate support to the public/ households. Other than that, education on such matter needs to be taught since pre-school as positive habits can be cultivated since young. Other than that, according to [21], utilising renewable resources like agricultural and their biodegradability in different environments enabled these polymers to be more easily acceptable than the conventional plastics. Plus, the environment in which they are located plays a crucial role in their biodegradation

Malaysia is still very amateur in this area and is still in the learning and acceptance stage among its people. More awareness and education programme pertaining to this issue are needed in a country-wide scale. Appropriate and adequate campaign and awareness would be able to project a better reception and results from its people, instead of imposing fine. It would be better to educate the people than to adopt the “carrot or cane” approach. Apart from this, Malaysia can consider to invest and adopt the waste to energy (WTE) technologies developed countries used. According to [1], uunsanitary land filling is the most commonly practiced waste disposal option in the developing countries. However, developed countries have realised the potential of WTE technologies for effective municipal solid waste management (MSWM). Recycling of plastics is urged by the need for closing material loops to maintain the natural resources when striving towards circular economy, but also by the concern raced by observations of plastic scrap in oceans and lakes as packaging industry is the sector using the largest share of plastics, hence packaging dominates in the plastic waste flow in most countries including Malaysia [11].

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