Behavioural Determinants of Domestic Solid Waste Minimization-A Malaysian Perspective

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Abstract. The rapid growth in population and change in life style has increased the household wastes throughout the world and as a consequence, there has been a clarion call towards minimising the waste. In spite of all the efforts, the core problem lies in minimising the waste at an early stage and Malaysia is also facing similar problems with a drastic increase in municipal waste generation which seeks a immediate remedy in order to safeguard its environment from damaging effects.This research aims at studying the impact of Education, promotion, knowledge, awareness and reference group on the intention to minimize waste which will lead to a changed behaviour of individuals on waste minimization in Malaysia. To test the model, a sample of 300 households from all nine districts of Selangor State will be selected and the questionnaire will be used as the main tool of data collection. The structural equation model will be used. The descriptive statistics, correlation analysis, factor analysis and path analysis will be used according to the requirement. The developed model will then be recommended to other states for their adoption with necessary changes. The study will lead to the application of the new model with a wider application practically by upgrading the current practices of solid domestic waste minimisation.

Keywords: Waste minimization, Intention, Behaviour

1. Introduction

Solid waste management in Malaysia has become a Himalayan task in recent years due to industrialization as well as increase in the amount and the types of waste generated. As rightly pointed out in Vision 2020, with the steep increase in population, the solid waste disposal issues have become more complicated [1].The inadequate waste minimization practices have led to tremendous environmental problems in Asia region [2]. Moreover, the consumption patterns have led to a quantum jump in solid waste generation [3]. Every household activity leads to solid waste generation and it is becoming more acute in the recent days[4].Inspite of the existing methods, procedures and policies towards reuse and recycle, there is still a gap when it comes to reality and hence solid waste minimization is a major priority issue all over the world [5].In Malaysia, the respective municipal council collect, transport and dispose the domestic solid wastes and they spend their time to come up with new methods to minimise the domestic solid waste. Waste means any substance or object in which the holder discards or intends to discard [6].Waste is anything that does not add value to the end user and something for which the customer is not willing to pay.

2. Waste Management- The Malaysian Scenario

The average per capita rate had increased from 0.67 kg/capita/day in 2001 to 0.8 kg/capita/ day in 2005 and is expected to increase to double digits on par with the population growth by the year 2020. In Malaysia, the components of MSW consisting of food waste (45%), plastic (24%) followed by paper (7%), iron (6%)

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and lastly 3% for glass and others [7]. Currently the per capita generation in Peninsular Malaysia is nearly1.2 kg of municipal waste (MSW) amounting to 19,000 tonnes of waste per day and it is set to rise to 30,000 tons daily by 2020, proportionate with the population growth[8]. From these, it is obvious that Malaysia has no choice than to manage its waste disposal efficiently and immediately if it wants to safeguard its environment from harmful effects [9].The municipal waste generation has increased from 5.6 million tons in 1997 up to 8.0 million tons, creating an urgent need for better options [10]. The total tonnage of domestic waste, bulky/garden, cleansing waste and illegal dumping in few states are listed in table 1.

Table 1 Waste generation in select states (Tons) Source: Alam Flora

State	2007	2008	2009
Kuala Lumpur	685,031	762,242	755,873
Selangor	1,083,410	1,101,658	1,131,791
Pahang	182,637	188,515	205,419
TOTAL	**1,951,078**	**2,052,414**	**2,093,083**

Therefore, a continuous effort is required to bring the changes and this is possible only when the people change their intention to minimise the waste. Hence this research makes an attempt to identify the factors that creates an intention to bring changes in the behaviour of the individuals. However, Malaysian government gives special priority to MSW management and in the Tenth Malaysia Plan, the National Strategic Plan is emphasised on this. In 2007 new legislation to streamline solid waste management was enacted to make effective implementation. They emphasised on increasing the awareness campaigns and related activities to educate the public which will lead to waste minimization. The establishment of the solid waste and public cleansing management corporation [11] becomes highly essential in implementing solid waste policy, planning and management in a better way. There is a lack of proper disposal of Municipal Solid Waste (MSW) in Malaysia which in turn pollutes the ecosystem and this has captured the attention of the researchers to identify a suitable model for solid waste minimization [12].

3. Problem Statement and Research Gap

Society is encountering serious threat arising out of the solid waste disposal issues mainly due to the rapid economic and population growth.In the recent period, the public conciousness is raising globally and this can be witnessed from the increasing awarenwss on waste generation and minimization.Many industralised nations have adopted waste management hierarchy to come up with effectic strategies based on their population growth, socioeconomic conditions and environmental regulations [13].A effective way to tackle this situation is to find ways to reduce the waste being generated. Previous researchers have focused on waste minimization in industries and commerce. Hence this research is focused on the domestic solid waste minimisation in Selangor state.Selangor has the largest population in Malaysia at 5,411,324 as of 2010. In spite of the government initiatives in bringing awareness, the results are not very fruitful, mainly due to lack of interest and participation of the households. This research identifies the perception of the factors influencing people to create intention towards waste minimisation. A model is also developed and qualitative and quantitative methods will be used in the study.

3.1 Research Questions

- What constitutes the household solid waste?
- What is the relationship between education, promotion, knowledge, awareness, and reference group on the intention to minimize waste?
- Do knowledge and awareness mediate the relationship between education and promotion with intention to minimize waste?
- Does intention to minimise waste mediate the relationship between education, promotion, knowledge, awareness, and reference group in bringing changed behaviour on waste minimization?

3.2 Objectives of the Research

- To come out with a comprehensive waste audit of households in Selangor State
- To find out the relationship between promotion, knowledge, awareness, and reference group on the intention to minimize waste
- To analyse how knowledge and awareness mediate the relationship between education and promotion with intention to minimize waste
- To determine how intention to minimise waste mediates the relationship between education, promotion, knowledge, awareness, and reference group in bringing changed behaviour on waste minimization

4. Research Methodology

The research falls within the preview of social science research paradigm. Theory of planned behaviour and Knowledge management theory were considered in building the research model and a thorough review of literature will be done and the project team will liaise directly with the concerned local authorities and the ministries to get relevant information about the waste management policies and practices in Malaysia. This will provide a useful insight into the actual policies, practices, procedures and strategies that are in practice. Figure 1 depicts the proposed research model in this study.
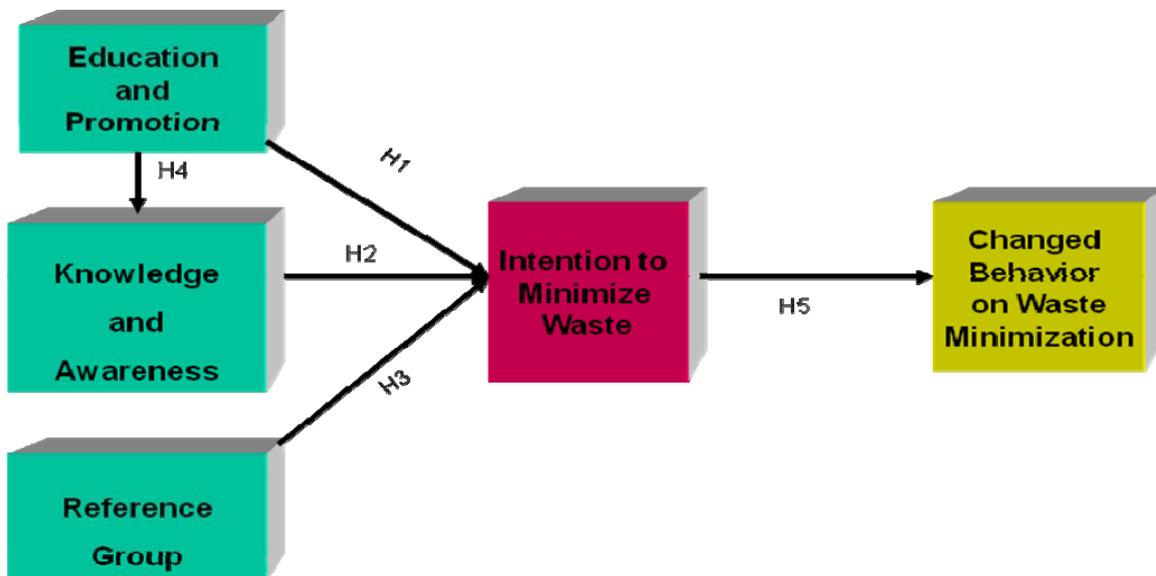

Fig. 1: Proposed Research Model

4.1 Hypotheses

The research hypothesis will be as follows:

- H1: There is a significant relationship between education and promotion and intention to minimize waste
- H2: There is a significant relationship between knowledge and awareness with intention to minimize waste.
- H3: There is a significant relationship between reference group and intention to minimize waste.
- H4: knowledge and awareness mediate the relationship between education and promotion with intention to minimize waste
- H5: Intention to minimize waste mediates the relationship between independent variables and change behavior on waste minimization.

4.2 Sampling

The research will be conducted in all nine districts of Selangor State in Malaysia as a cross sectional survey consisting of households and the developed model will then be recommended to other states for their adoption with necessary changes. Proportionate random sampling will be done according to the races. It is proposed to collect the data from around 300 households representing Malay, Chinese, Indian and other nationals. The state's ethnic composition consists of Malay 52.9%, Chinese 27.8%, Indian 13.3%, and other ethnic groups 6%.

4.3 Data Collection

A questionnaire-based survey will be conducted to obtain information about current levels of education, promotion, knowledge, awareness, reference group, intention and changed behavioural practices on waste minimization in sample households in Selangor state. The questionnaire will also have a series of open-ended questions concerning barriers to waste and its minimisation. The data collected through the questionnaire will be subjected to a number of checks to be performed at various stages to ensure the quality of data and the quality of the data input process. The analysis of data will result in (i) summary statistics of key individual variables; (ii) summary statistics for scores representing awareness, attitudes and practices; (iii) correlations between key individual variables and scores representing awareness, attitudes and practices. Since this model requires analysis in more than one stage, the structured equation model will be used. The descriptive statistics, correlation analysis, factor analysis and path analysis will be used according to the requirement.

5. Conclusion

The study will lead to the application of the new concept with a wider application practically by upgrading the current practices of solid domestic waste minimisation. The outcome of this research will lead to many future studies in the area of waste minimization. The model will then be recommended to other states for their adoption with relevant changes according to their needs.The MSW management strategies should be properly scrutinized and handled carefully by creating an international environmental standard which can minimise the adverse effect of safe living and comfortable atmosphere. MSW generation can never be avoided as long as human beings exist and they generate trash due to population growth as well as demands arising from modern society. [14].It is vested in the hands of the citizens who should put substantial effort and take initiative to bring basic behavioural change towards waste minimization.

6. References

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