UNDERSTANDING MALAYSIAN HOUSEHOLD WASTE SEPARATION: AN EXTENDED THEORY OF PLANNED BEHAVIOUR

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ABSTRACT

The strike of COVID-19 in March 2020 has caused the implementation of the Movement Control Order (MCO) and lockdown by the Malaysian government. As a consequence, MCO has changed Malaysians' norms. Many Malaysians have become compulsive online buyers and the food waste issue has occurred due to the problem of over-purchasing. This study intends to extend the Theory of Planned Behaviour (TPB) in influencing waste separation among households. This study investigates the influence of descriptive norms, personal norms, and cognition of consequences towards the intention to separate waste. This research used a quantitative online survey and convenience sampling. A final and valid sample of 300 households was analysed using Pearson correlation. This research indicates that descriptive norms and cognition of consequences significantly influence the intention of Malaysian households to separate waste. On the other hand, personal norms do not have an influence on the waste separation intention. Therefore, the government, local authorities, related agencies, and non-governmental organisations (NGOs) should ensure that the Malaysian public is aware of the importance of protecting the environment. This study is unique since many studies have focused on the recycling intentions and behaviour and this study is among new and pioneer studies that apply

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the extended TPB in investigating the determinants of household waste separation in Malaysia during the pandemic COVID-19.

Keywords*: Descriptive Norms, Personal Norms, Cognition of Consequences, Extended Theory of Planned Behaviour (TPB)*

INTRODUCTION

Massive waste production has occurred due to the nationwide lockdown where people have panickily store food products and supplies (Wang & Na, 2020). The lockdowns also have changed people's behaviour in shopping from the offline store into online shopping (Jaravel & O'Connell, 2020). According to SWCorp Malaysia (Solid Waste and Public Cleansing Management Corporation), the household sector accounts for almost 50% of food waste generated in Malaysia daily (Malay Mail, October 20, 2020). The number of wastes also increases due to the increase in the population (Morone et al., 2019; Aktas et al., 2018). In addressing the waste problems and achieving the 17 Sustainable Development Goals (SDGs) by the United Nations (UN), Malaysian households should take part by practising waste separation at home. The Malaysian government also has launched the Separation at Source Initiative (SSI) under the Solid Waste and Public Cleansing Management Act 2007 (Act 672) in September 2015. Unfortunately, many Malaysian households are not committed to practice waste separation behaviour (Razali et al., 2020; Moh, 2017). In addition, Malaysia also faces several challenges such as weak enforcement, lack of expertise and technology, illegal dumping, and lack of budget for implementation (Halmi & Ismail, 2017; Sidhu & Gibbon, 2021; Zainu & Songip, 2017). Poor environmental awareness and attitude also lead to poor waste management in Malaysia (Ridzuan et al., 2017; de Oliveira, 2019).

Developed by Ajzen (1991), according to the theory of planned behaviour (TPB), the willingness to adopt a particular action and behaviour is determined by the person's intention. Many studies such as Ayob et al. (2017) and Zhang et al. (2021) employed the TPB to understand households' waste separation intention and behaviour. The individual intention is influenced by three main determinants which include attitude, subjective

norm, and perceived behaviour control. Despite the extensive use of the TPB model in analysing waste separation behaviour, it has been criticised for its rationality and the variation in observed behaviour is not explained. Based on this argument, this study has included another determinant to represent the variables. These include descriptive norms, personal norms, and the cognition of consequences. Descriptive norm refers to the extent to which individuals believe that other households such as family members, peers, co-workers, neighbours, and others separate their domestic waste. Thus, people will engage in separating waste when their surroundings also do the same (Leoniak & Cwalina, 2019). Next, personal norms describe one behaviour that determines his or her lifestyle or individual personal obligation to participate in a particular behaviour (Ofstad et al., 2017). For instance, an individual has the belief that recycling or waste separation is good. While the cognition of consequences refers to the individual's knowledge of the consequences of a given behaviour (Ibrahim et al., 2018). For instance, an individual believes that separating the waste could help to reduce environmental pollution.

A systematic survey and analysis of waste separation intention are needed and crucial for future waste separation programs or plans. Therefore, this study's primary aim was to understand the factors that influence the intention to separate household waste among Malaysian households. The outcome of this study can be used to provide some recommendations to promote household waste separation for better management of the environment. This study also has delivered two important insights to the current literature in waste management and environmental studies. First, this study extends the TPB model and aims to validate the model. Second, this study has tested the model within the context of Malaysian households which could deliver more imperative insights for the current and future research.

The structure of this paper is as follows. Following this introduction part, the literature review and hypotheses development are explained. Then, the explanation regarding the data and methodology followed by the data analysis and results of the research. After the results are highlighted, the discussion and research implications are justified. Lastly, the conclusions and limitations of the study are described.

LITERATURE REVIEW

The Extended Theory of Planned Behaviour in Understanding Waste Separation Intention

Solid waste management is important nowadays particularly with the increase in the world population, the amount of waste also has been increasing. As waste generation increases, so does the importance of having an effective solid waste management system in place. The Malaysian government has implemented various laws and regulations. The ABC Plan (Action Plan for a Beautiful and Clean Malaysia) in 1987 was a starting point of the national waste management plan in Malaysia (Moh, 2017). Following the ABC Plan, two more recycling programs were introduced in 1993 and 2000. With the introduction of the Solid Waste and Public Cleansing Management Act 2007 (also known as ACT 672), municipal solid waste (MSW) management is now standardized, and obligatory waste separation and recycling is officially promoted in Peninsular Malaysia since 2011. To carry out the mandatory waste separation by households, the SWCorp Strategic Plan 2014–2020 is also introduced (Moh, 2017).

Despite the numerous efforts, the waste separation rate in Malaysia is still at the minimum level (Razali et al., 2020; Moh, 2017; Sidhu & Gibbon, 2021; Zainu & Songip, 2017). Therefore, it is important to encourage people's intention to separate waste to ensure any waste separation or recycling program is successful. In identifying the factors that influence waste separation intention, many studies have employed the TPB in providing a comprehensive and systematic framework on the determinants of specific intention and behaviour. Successful applications of the TPB across various environmental behaviour can potentially reflect its potential in explaining waste separation intention. The TPB has recognized three main determinants of individual intention and behaviour. These include attitude, subjective norm, and perceived behavioural control (Ajzen, 1991). Attitude refers to the individual evaluation of a specific behaviour either positive or negative (Greaves et al., 2013). For instance, when the individual believes that waste separation will produce a cleaner environment, thus, this will increase the likelihood of engaging in waste separation. While subjective norm refers to social approval or disapproval of a specific behaviour. For example, if

the friends and lecturers think waste separation is good, the individual will tend to separate waste. Finally, perceived behavioural control refers to the ability to perform a specific behaviour such as strict regulation required to separate waste or incentive provided to encourage the behavior. TPB also had been criticized for insufficiency in capturing the important determinants that predict the behaviour (Heidari et al., 2018). Within this study, two new variables have been included (i.e., personal norms and cognition of consequences) to assess individuals' willingness to separate waste.

Descriptive Norms

Descriptive norms stated that people will engage in pro-environmental behaviour when they see other people also performing the behaviour (Leoniak & Cwalina, 2019). Several studies recorded the positive influence of descriptive norms on waste separation intention (Xu et al., 2017; Vassanadumrongdee & Kittipongvises, 2018). Wan, Shen, and Choi's (2017) study has found that descriptive norms increase the likelihood of recycling and motivates people to practice recycling behaviour. Based on the survey data collected in Nanning city in China, Chen and Lee (2020) found that facilitating conditions, subjective norms, and moral norms are all significant predictors of waste separation attitude. Next, in investigating Bangkok residents' separation intention, Vassanadumrongdee and Kittipongvises (2018) discovered that both subjective norms and knowledge were found to be a positive correlation with Bangkok residents' source separation intention. While Li et al.' (2020) results showed descriptive norms mediates the relationship between mandatory policies and residents' willingness to separate waste. Therefore, this study proposed the following hypotheses:

Ho1: There is an insignificant relationship between descriptive norms and intention to separate waste among Malaysian households.
Ha1: There is a significant relationship between descriptive norms and intention to separate waste among Malaysian households.

Personal Norms

Personal norms can be defined as individual values and beliefs about what the general population perceives or does. Previous studies have found that people's feelings of a moral obligation to protect the environment were

positively correlated to their engagement waste separation (Khalil et al., 2017; Ofstad et al., 2017). Wang et al.' (2019) study has found that personal norm has the largest direct positive effect on resident's waste separation intention. They concluded that higher moral obligations to separate waste are important to promote waste separation behaviour. In examining the perception of the 350 households in the Johannesburg metropolitan area, Issock, Roberts-Lombard, and Mpinganjira (2020) have discovered that personal norms were identified as the strongest predictor of behaviour intention ($\beta= 0.348$; $p<0.01$). The personal norms of an individual also could be influenced by external factors. For instance, Stoeva and Alriksson's (2017) results showed that a lack of proper conditions for waste separation can affect the individual positive evaluation of waste separation. Thus, when individuals feel that they have a moral obligation to act and protect the environment, they will be more willing to conduct these behaviors (Wang et al., 2018). Then, based on the data collected from 352 Malaysian public, Chun T'ing et al.' (2021) results show that attitude, perceived behavioural control, and personal norms have a significant effect on behavioral intention to reduce food waste. Based on this reasoning, this study posits:

Ho2: There is an insignificant relationship between personal norms and intention to separate waste among Malaysian households.
Ha2: There is a significant relationship between personal norms and intention to separate waste among Malaysian households.

Cognition of Consequences

Cognition of consequences refers to people's awareness and knowledge towards the outcome of waste separation or not separating the waste. Previous studies also have found that awareness of a certain behaviour increases the intention to perform the behaviour (White et al., 2019; Sorkun, 2018). According to the norm activation model (NAM), when individuals realize the negative consequences caused by their non-environmental behaviours, they are more likely to change their negative behaviours (Saphores et al., 2012, Wang et al., 2018). Therefore, if people are aware of the negative consequences of not separating their waste, they will be more willing to separate waste in their daily lives (Echegaray & Hansstein, 2017). Meng et al. (2019) also have found that residents' environmental awareness acts as one of the main determinants that influence individual waste separation. By

creating awareness, it could promote waste separation behaviour (Zhang et al., 2018). Thus, environmental knowledge and information on the impact of waste separation and the approaches to carry out waste separation are crucial. Therefore, this study proposed the following hypotheses:

Ho3: There is an insignificant relationship between cognition of consequences and intention to separate waste among Malaysian households.

Ha3: There is a significant relationship between the cognition of consequences and the intention to separate waste among Malaysian households.

Figure 1 represents the conceptual framework which highlighted the factors that influence the intention to separate waste.
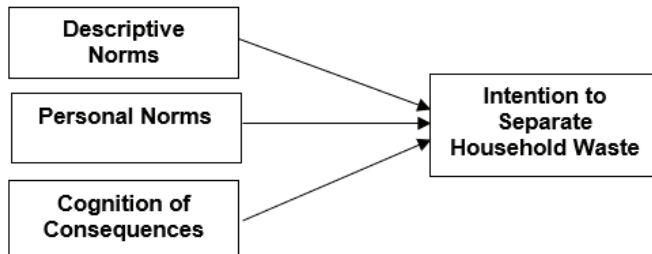

Figure 1. Conceptual Framework on the Factors that Influence the Intention to Separate Household Waste
Source: Adapted from Issock, Roberts-Lombard, & Mpinganjira, (2020).

RESEARCH METHODOLOGY

A cross-sectional design by using the quantitative method and a non-probability convenience sampling was used in this study. Following the Krejcie and Morgan Table of 1970, the sample of 384 individual households was defined for data collection (N=32.75 million). It should be noted that as the population increases the sample size increases at a diminishing rate and remains relatively constant at slightly more than 380 cases (Krejie & Morgan, 1970). Thus, 384 surveys have been distributed and usable questionnaires were received from 300 respondents, representing a response rate of 78.1%. As highlighted by Yun and Trumbo (2000), an online survey incorporating multi approaches such as multiple contacts, presence, inducements, and personalization may yield response rates as high as 70%. Table 1 summarizes the profile of respondents collected in

this study. Among the 300 respondents were involved in this study, 192 respondents are female (64%) and 108 respondents are male (36%). Then, most of the respondents are less than 28 years old (n = 146, 48.7%). Then, the majority of the respondents are from the private sector (n=129, 43.0%). This is followed with unemployed (n=116, 38.7%), public sector (n=31, 10.3%), and self-employed (n=24, 8.0%).

Table 1. Demographic Profile

No.	Profile	Frequency (n)	Percentage (%)
1	**Gender** Male female	108 192	36.0 64.0
2	**Age** <18-28 years old 29-39 years old 40-50 years old 51-61> years old	146 58 87 9	48.7 19.3 29.0 3.0
3	**Employment Sector** Government Sector Private Sector Self-employed Unemployed	31 129 24 116	10.3 43.0 8.0 38.7

Source: Author

All variables are measured based on Issock, Lombard, and Mpinganjira's (2019) study. All dimensions for each variable used the Likert Scale to examine how strongly respondents agree or disagree with statements on a five-point scale. Table 2 summarizes the details of the measurement.

Table 2. Details of Measurement

Variable	Question
Descriptive Norms	1)Most people who are important to me already separate waste in their households. 2)Most people in my circle engage in household waste separation. 3)Most of my friends separate the waste in their households. 4)My family members separate the waste in their households.
Personal Norms	1)Due to my values, I feel obliged to separate waste materials in my house. 2)No matter what people think or do, I feel personally obliged to separate waste material in my house. 3)I feel that it is important to separate household waste material for future disposal. 4)People like me should do everything they can to separate household waste.

Cognition of Consequences	1)Separating household waste reduces pollution. 2)Separating household waste reduces the wasteful use of landfills. 3)Separating household waste conserves natural resources.
Intention to Separate Waste	1)I intend to start/continue separating my household waste as much as possible within the next three months. 2)I want to start/continue participating in a household waste separation program within the next three months. 3)I will start/continue separating my household waste whenever I have it for disposal. 4)I am willing to participate in the waste separation program implemented in my area.

Source: Adapted from Issock, Roberts-Lombard, & Mpinganjira, (2020).

Before conducting data analysis, data were checked for completeness, and simple frequency runs were performed to screen the data to identify missing values. After that, descriptive statistics involving frequency distribution were generated. Cronbach's alpha is used to test for the internal consistency of measures. The reliability value less than 0.60 is poor, 0.60 to 0.70 is moderate, 0.70 to 0.80 is good, 0.80 to 0.90 is exceptionally good, and 0.90 is excellent (Sekaran & Bougie, 2016). To test the normality of the data, Kline (2005) stated that the skewness value should fall within the range of -3 to +3, and the kurtosis value should fall within the range of -10 to +10 to indicate the normal distributions. The Pearson correlation coefficient was used before goodness of measure to establish the relationship between predictor variables and the criterion variable.

FINDINGS

Table 3. Normality and Reliability Results

Variable	Mean	SD	Skewness	Kurtosis	Cronbach's Alpha >0.60
Independent Variable:					
Descriptive Norms	3.91	0.71	-0.26	-0.27	0.87
Personal Norms	3.11	0.83	0.11	0.04	0.90
Cognition of Consequences	4.22	0.64	-0.56	0.04	0.88
Dependent Variable:					
Intention to Separate	4.63	0.60	-1.79	3.03	0.90

Source: Author

Descriptive analysis was performed to examine the mean (M) and standard deviation (SD) of the variables. Most scores mean above the midpoint of 2.5, between 3.91 to 4.22 (refer to Table 3). These results indicate the overall positive response to the study. The standard deviation value indicates a narrow spread around the mean. Next, the skewness value should be in the range of -2.0 to +2. 0 and -7.0 to +7.0 of the kurtosis values should be achieved to indicate the normal distribution (Kline, 2003). This study achieved the assumptions of normality as what has been portrayed based on the results of the normality test. Finally, the value of Cronbach's Alpha for Descriptive Norms (0.87), Personal Norms (0.90), Cognition of Consequences (0.88), and Intention to Separate Waste (0.90) are above 0.60 which indicate good reliability.

Table 4. Correlation Results

Variable		Result	H0	Ha
Descriptive Norms	Pearson Correlation Sig. (1-tailed) N	0.330** 0.000 300	Rejected	Accepted
Personal Norms	Pearson Correlation Sig. (1-tailed) N	0.084 0.146 300	Accepted	Rejected
Cognition of Consequences	Pearson Correlation Sig. (1-tailed) N	0.524** 0.000 300	Rejected	Accepted

Source: Author

As we can see, from Table 4, there is a positive relationship between descriptive norms and intention to separate waste (r= 0.330**, p=0.000, $p < 0.05$). Therefore, Ho1 was rejected and Ha1 was accepted. Then, there is no relationship between personal norms and intention to separate waste (r= 0.084, p=0.146, $p > 0.05$). Therefore, Ho2 was accepted and Ha2 was rejected. Finally, there is a positive relationship between cognition of consequences and intention to separate waste (r= 0.524**, p=0.000, $p < 0.05$). Therefore, Ho3 was rejected and Ha3 was accepted.

DISCUSSION

The study first shows that there is a significant and positive relationship between descriptive norms and intention to separate waste. This study has been supported by previous studies such as Leoniak and Cwalina (2019), Xu

et al. (2017), and Vassanadumrongdee and Kittipongvises (2018). Second, the study shows that there is no relationship between personal norms and intention to separate waste among Malaysian households. Finally, there is a positive relationship between cognition of consequences and intention to separate household waste. Previous studies also have found that awareness of a certain behaviour increases the intention to perform the behaviour (White et al., 2019; Sorkun, 2018; Saphores et al., 2012, Wang et al., 2018). This research holds interesting implications for theoretical underpinning in which this study offers an extensive set of the TPB. Second, the present research reports on how social support and individual awareness of environmental degradation and pollution could facilitate the public waste separation behaviour. It is therefore not enough for the government or local authority to implement a mandatory waste separation policy; they also need to educate the public on the impact of not separating waste. The government and local authorities are encouraged to establish the waste separation norm. For instance, providing incentives or rebates for those who perform waste separation or acknowledge the family who performs waste separation. This practical intervention could encourage the household to separate their domestic waste. Next, the government needs to cooperate with NGOs and media in distributing pamphlets and brochures that educate and explain the environmental crises and possible actions to prevent the issues. Utilizing the power of social media will increaseġ public knowledge and awareness on waste separation. The role of NGOs and mass media as supporters and their influence especially during an environmental crisis is undeniable. For example, the Institute for Global Environment Strategies and the United Nations Environment Program developed a series of lesson plans for primary school teachers in Cambodia looking to add environmental education and waste management to their curriculum (the United States Environmental Protection Agency, 2020). Moreover, the availability of an effective recycling infrastructure that allows households to recycle their waste is needed. In Malaysia, there is a lack of recycling facilities and collection centers, thus more infrastructure should be provided to the public. For example, Battambang partnered with NGOs, the Cambodian Education, and Waste Management Organization, and the Institute for Global Environmental Strategies to design strategies for effective solid waste management (the United States Environmental Protection Agency, 2020).

CONCLUSION

This study helps the future researcher to gain new insights on the relationship between descriptive norms, personal norms, and cognition of consequences towards household waste separation. This study offers a clearer insight into the potential drivers of household separation of waste before disposal. As for theoretical contribution, this study helps to extend the determinants of TPB especially from the context of environmental studies since this study has introduced two new variables (i.e., personal norms and cognition of consequences) to assess individuals' willingness to separate waste. Furthermore, the results also indicate that future waste management should change from the current governmental-centered strategy to the community empowerment strategy. Although the study makes significant theoretical and practical contributions, it has some noteworthy limitations. First, this study relied on a survey approach that may affect the results of this study. Some of the respondents may not have stated truthful responses to keep their feedback confidential. Therefore, future research is encouraged to adopt a qualitative approach such as observation, focus group discussion, and interview. Second, the model of the study is limited where there are only three independent variables and one dependent variable. It can lead to a lack of internal and external validity. Future research is recommended to provide another variable to further improve the quality of the existing model.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behaviour and Human Decision Processes, 50*(2), 179–211.

Aktas, E., Sahin, H., Topaloglu, Z., Oledinma, A., Huda, A.K.S., Irani, Z., Sharif, A.M., van't Wout, T., & Kamrava, M. (2018). A consumer behavioural approach to food waste. J*ournal of Enterprise Information Management, 31*(5), 658-673.

Ayob, S. F., Sheau-Ting, L., Abdul Jalil, R., & Chin, H.-C. (2017). Key determinants of waste separation intention: *Empirical application of TPB. Facilities, 35*(11/12), 696-708.

Chen, B., & Lee, J. (2020). Household waste separation intention and the importance of public policy. *International Trade, Politics and Development, 4*(1), 61-79.

Chun T'ing, L., Moorthy, K., Gunasaygaran, N., Sek Li, C., Omapathi, D., Jia Yi, H., ... & Sivakumar, K. (2021). Intention to reduce food waste: A study among Malaysians. *Journal of the Air & Waste Management Association,* 1-16.

de Oliveira, J. A. P. (2019). Intergovernmental relations for environmental governance: Cases of solid waste management and climate change in two Malaysian States. *Journal of Environmental Management*, 233, 481-488.

Echegaray, F., & Hansstein, F. V. (2017). Assessing the intention-behavior gap in electronic waste recycling: the case of Brazil. *Journal of Cleaner Production,* 142, 180-190.

Greaves, M., Zibarras, L. D., & Stride, C. (2013). Using the theory of planned behavior to explore environmental behavioral intentions in the workplace. *Journal of Environmental Psychology,* 34, 109-120.

Halmi, N. Q. A., & Ismail, Z. (2017). Nvironmental pollution and existing regulations: A review analysis. *Malaysian Journal of Sustainable Environment, 2*(1), 73-86.

Heidari, A., Kolahi, M., Behravesh, N., Ghorbanyon, M., Ehsanmansh, F., Hashemolhosini, N., & Zanganeh, F. (2018). Youth and sustainable waste management: A SEM approach and extended theory of planned behavior. *Journal of Material Cycles and Waste Management, 20*(4), 2041-2053.

Ibrahim, A., Knox, K., Rundle-Thiele, S., & Arli, D. (2018). Segmenting a water use market: Theory of interpersonal behavior insights. *Social Marketing Quarterly, 24*(1), 3-17.

Issock, P. B., Roberts-Lombard, M., & Mpinganjira, M. (2020). Understanding household waste separation in South Africa: An empirical study based on an extended theory of interpersonal behaviour. *Management of Environmental Quality, 31*(3), 530-547.

Issock, P. B., Mpinganjira, M., & Roberts-Lombard, M. (2020). Modelling green customer loyalty and positive word of mouth: Can environmental knowledge make the difference in an emerging market? *International Journal of Emerging Markets, 15*(3), 405-426.

Jaravel, X., & O'Connell, M. (2020). High-frequency changes in shopping behaviours, promotions, and the measurement of inflation: Evidence from the Great Lockdown. *Fiscal Studies, 41*(3), 733-755.

Khalil, M. S., Abdullah, S. H., Abd Manaf, L., Sharaai, A. H., & Nabegu, A. B. (2017). Examining the moderating role of perceived lack of facilitating conditions on household recycling intention in Kano, Nigeria. *Recycling, 2*(4), 18.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York, NY: Guilford Press.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Li, W., Jin, Z., Liu, X., Li, G., & Wang, L. (2020). The impact of mandatory policies on residents' willingness to separate household waste: A moderated mediation model. *Journal of Environmental Management,* 275, 111226.

Leoniak, K. J., & Cwalina, W. (2019). The role of normative prompts and norm support cues in promoting light-switching behavior: A field study. *Journal of Environmental Psychology*, 64, 1-11.

Malay Mail (October 20, 2020). *As CMCO returns, so does food waste*. Retrieved on 30 April 2021 from https://www.malaymail.com/news/

malaysia/2020/10/20/as-cmco-returns-so-does-food-waste/1914411

Meng, X., Tan, X., Wang, Y., Wen, Z., Tao, Y., & Qian, Y. (2019). Investigation on decision-making mechanism of residents' household solid waste classification and recycling behaviors. Resources, *Conservation and Recycling*, 140, 224-234.

Moh, Y. (2017). Solid waste management transformation and future challenges of source separation and recycling practice in Malaysia. *Resources, Conservation and Recycling*, 116, 1-14.

Morone, P., Koutinas, A., Gathergood, N., Arshadi, M., & Matharu, A. (2019). Food waste: Challenges and opportunities for enhancing the emerging bioeconomy. J*ournal of Cleaner Production*, 221, 10-16.

Ofstad, S. P., Tobolova, M., Nayum, A., & Klöckner, C. A. (2017). Understanding the mechanisms behind changing people's recycling behavior at work by applying a comprehensive action determination model. *Sustainability, 9*(2), 204.

Razali, F., Daud, D., Weng-Wai, C., & Jiram, W. R. A. (2020). Waste separation at source behaviour among Malaysian households: The Theory of Planned Behaviour with the moral norm. *Journal of Cleaner Production*, 271, 122025.

Ridzuan, M. R., Abd. Rahman, N. A. S., Hussin, N. S., & Awang, N. (2017). Recycling endeavours among the PPR residents in Kuala Lumpur: A qualitative approach. Malaysian Journal of Sustainable Environment, 3(2), 117-138.

Saphores, J. D. M., Ogunseitan, O. A., & Shapiro, A. A. (2012). Willingness to engage in a pro-environmental behavior: An analysis of e-waste recycling based on a national survey of US households. Resources, Conservation and Recycling, 60, 49-63.

Sekaran, U. and Bougie, R. (2016). Research methods for business, A skill-building approach. John Wiley & Sons.

Sorkun, M. F. (2018). How do social norms influence recycling behavior in a collectivistic

society? A case study from Turkey. *Waste Management,* 80, 359-370.

Stoeva, K., & Alriksson, S. (2017). Influence of recycling programmes on waste separation behaviour. Waste Management, 68, 732-741.

United States Environmental Protection Agency (2020). Best practices for solid waste management: A guide for decision-makers in developing countries. Retrieved on 28 April 2021 from https://www.epa.gov/sites/production/files/2020-10/documents/master_swmg_10-2020_0.pdf

Vassanadumrongdee, S., & Kittipongvises, S. (2018). Factors influencing source separation intention and willingness to pay for improving waste management in Bangkok, Thailand. Sustainable Environment Research, 28(2), 90-99.

Wan, C., Shen, G. Q., & Choi, S. (2017). Experiential and instrumental attitudes: Interaction effect of attitude and subjective norm on recycling intention. Journal of Environmental Psychology, 50, 69-79.

Wang, H. H., & Na, H. A. O. (2020). Panic buying? Food hoarding during the pandemic period with city lockdown. Journal of Integrative Agriculture, 19(12), 2916-2925.

Wang, S., Fan, J., Zhao, D., Yang, S., & Fu, Y. (2016). Predicting consumers' intention to adopt hybrid electric vehicles: Using an extended version of the theory of planned behavior model. Transportation, 43(1), 123-143.

Wang, S., Wang, J., Zhao, S., & Yang, S. (2019). Information publicity and resident's waste separation behavior: An empirical study based on the norm activation model. Waste Management, 87, 33-42.

White, K., Habib, R., & Hardisty, D.J. (2019). How to SHIFT consumer behaviors to be more sustainable: a literature review and guiding framework. Journal of Marketing, 83(3), 22-49.

Xu, L., Ling, M., Lu, Y., & Shen, M. (2017). Understanding household waste separation behaviour: testing the roles of moral, experience, and perceived policy effectiveness within the theory of planned behaviour.

Sustainability, 9(4), 1-27.

Yun, G. W., & Trumbo, C. W. (2000). Comparative response to a survey executed by post, e-mail, & web form. Journal of Computer-Mediated Communication, 6(1).

Zainu, Z. A., & Songip, A. R. (2017). Policies, challenges, and strategies for municipal waste management in Malaysia. Journal of Science, Technology and Innovation Policy, 3(1).

Zhang, S., Hu, D., Lin, T., Li, W., Zhao, R., Yang, H., ... & Jiang, L. (2021). Determinants affecting residents' waste classification intention and behavior: A study based on TPB and ABC methodology. Journal of Environmental Management, 290, 112591.

Zhang, X., Liu, J., & Zhao, K. (2018). Antecedents of citizens' environmental complaint intention in China: An empirical study based on norm activation model. Resources, Conservation and Recycling, 134, 121-128.