

# **Capturing the Low-Cost Housing Residents' Sustainable Practices in Urban Area: The Moderating Effect of Perceived Policy Effectiveness**

Mohd Rozaimy Ridzuan<sup>1</sup>, Noor Amira Syazwani Abd Rahman<sup>1</sup>,  
Norhidayah Md Yusof<sup>2</sup> & Nur Ain Yaacob<sup>3</sup>

<sup>1</sup>Faculty of Administrative Science & Policy Studies, , Universiti Teknologi MARA (UiTM) Pahang Branch, Raub Campus, 27600 Raub, Pahang, Malaysia, <sup>2</sup>Akademi Pengajian Bahasa , Universiti Teknologi MARA (UiTM) Pahang Branch, Jengka Campus, 26400 Bandar Tun Abdul Razak (Bandar Jengka) Pahang, Malaysia, <sup>3</sup>Faculty of Administrative Science & Policy Studies, Universiti Teknologi MARA (UiTM) Negeri Sembilan Branch, Seremban 3 Campus, Negeri Sembilan, Malaysia

## **Abstract**

Globally, solid waste has contributed to environmental issues in many nations. Malaysia likewise one of the countries which has had trouble managing its solid waste since landfills are often used to dispose of garbage in Malaysia. People who live in low-cost apartments in Kuala Lumpur are frequently stereotyped as being preoccupied with the problem of garbage collection. It is commonly seen that low-income communities are more likely to engage in environmentally damaging garbage disposal practices. Looking at the households in low-income flats, notably those in Flat Projek Perumahan Rakyat (PPR) Sri Pantai, will provide useful insight into the factors that motivate people to recycle. This study employs the hypotheses study to test the moderating effects on the relationship between independent variables (attitudes, subjective norms, perceived behavioral control, and moral norms) and dependent variable (recycling intentions). 125 households of Flat PPR Sri Pantai, Pantai Dalam, Kuala Lumpur were surveyed for this study. Among four hypotheses, the perceived policy effectiveness only has moderating effects on subjective norms, perceived behavioral control, and moral norms.

**Keywords:** Low-Cost Housing, Moderating Variable, Perceived Policy Effectiveness, Recycling, Solid Waste Management, Sustainable Practices

## **Introduction**

Since solid waste issues have been brought to light in both developed and developing countries, there has been a rise in scholarly interest in environmental studies, notably in recycling activity. Particularly in densely populated places, a country's ability to deal with its solid waste would provide a formidable task. Land for solid waste disposal has become increasingly scarce as a result of urbanization (Moh & Latifah, 2014; Kaosol, 2009; Mahar et

al., 2007). Garbage production is also proportional to population growth, with each decade records a 90% increase in waste production (Magazzino et al., 2020; Mukherjee et al., 2020; Agamuthu & Fauziah, 2011).

This paper examines household recycling behavioral intentions at Flat PPR Sri Pantai, Pantai Dalam, Kuala Lumpur. There are four independent variables of the study namely attitude, subjective norms, perceived behavior control, and moral norms and the dependent variable of the study is recycling intention. Perceived policy effectiveness is employed in this study as suggested by Wan et al (2014) to examine whether this variable can serve as the moderating effect on the relationship between independent variables and the dependent variable. Previous studies have examined several moderating effects on recycling intentions. Chen & Tung (2009) employed a perceived lack of facilities as the study's moderating variable and Ittiravivongs (2012) on the role of responsibility. Based on the meta-analysis literature review, it is believed that there is a limited study that utilized perceived policy effectiveness as a moderating effect on recycling intentions. Hence, the present study incorporates perceived policy effectiveness as a moderating variable. The research objectives of the study can be listed as follows

1. To determine the moderating effect of perceived policy effectiveness on the relationship between attitude and households' recycling intention
2. To determine the moderating effect of perceived policy effectiveness on the relationship between subjective norms and households' recycling intention
3. To determine the moderating effect of perceived policy effectiveness on the relationship between perceived behavior control and households' recycling intention
4. To determine the moderating effect of perceived policy effectiveness on the relationship between moral norms and households' recycling intention.

## **Literature Review**

### **Hypothesis Development**

Wan et al (2014) claimed that the perceived policy effectiveness variable can be used as a moderating effect in studies of recycling intentions, in addition to its role as a direct variable of recycling intentions. Wan & Shen (2013) pointed out that a policy measure can be used to incentivize people to change their behavior. They also emphasized that if an individual sees a stronger and more effective motivator, it will boost his or her intent to conduct that behavior. MacKenzie & Spreng (1992) discovered that drive plays a moderating role in the connection between outlook and action. It is hypothesized that the relationship between attitude and recycling intentions would be moderated by perceived policy effectiveness, as policy measures act as motivation.

Furthermore, it is hypothesized that the relationship between subjective norms and recycling intentions will be negatively moderated by the perceived effectiveness of the policy. This is because if the local government significantly pushes recycling behavior, the influence of subjective norms toward recycling intentions would decrease (Wan et al., 2014). In other words, if a person's intention to recycle is heavily influenced by legislative measures, the influence of his or her social group (subjective norms) will be diminished.

An individual's recycling intentions are influenced both by inner factors like their perception of their power to change their behavior and by exogenous factors like their opinion of how effective government policies are at encouraging recycling (Wan et al., 2014). The reason is that people who can exert positive control over their actions are more likely to

recycle because they believe it will be easy to fit recycling into their daily routines (intrinsic motivation). People are more likely to recycle if they believe the government is making a concerted effort to get them to do so, and if such efforts are seen as being both clear and effective.

Besides, an individual's propensity to engage in recycling behavior may be affected by their sense of moral obligation. The impact of the moral norm on recycling intentions would weaken if a public authority successfully and adequately motivated and facilitated recycling behavior (Wan et al., 2014). Therefore, the purpose of this study is to verify that, contrary to what was claimed by Wan et al (2014), there is a negative moderating influence of perceived policy effectiveness between moral norms and recycling intentions. Several possibilities can be outlined based on the previous discussions, as follows

H1: The relationship between attitudes and recycling intentions will be positively moderated by perceived policy effectiveness.

H2: The relationship between subjective norms and household recycling intentions will be negatively moderated by perceived policy effectiveness.

H3: Perceived policy effectiveness will have a positive moderating effect on the relationship between perceived behavioural control and household recycling intentions.

H4: Perceived policy effectiveness will have a negative moderating effect on the relationship between moral norms and household recycling intentions.

**Conceptual Framework of this Study**

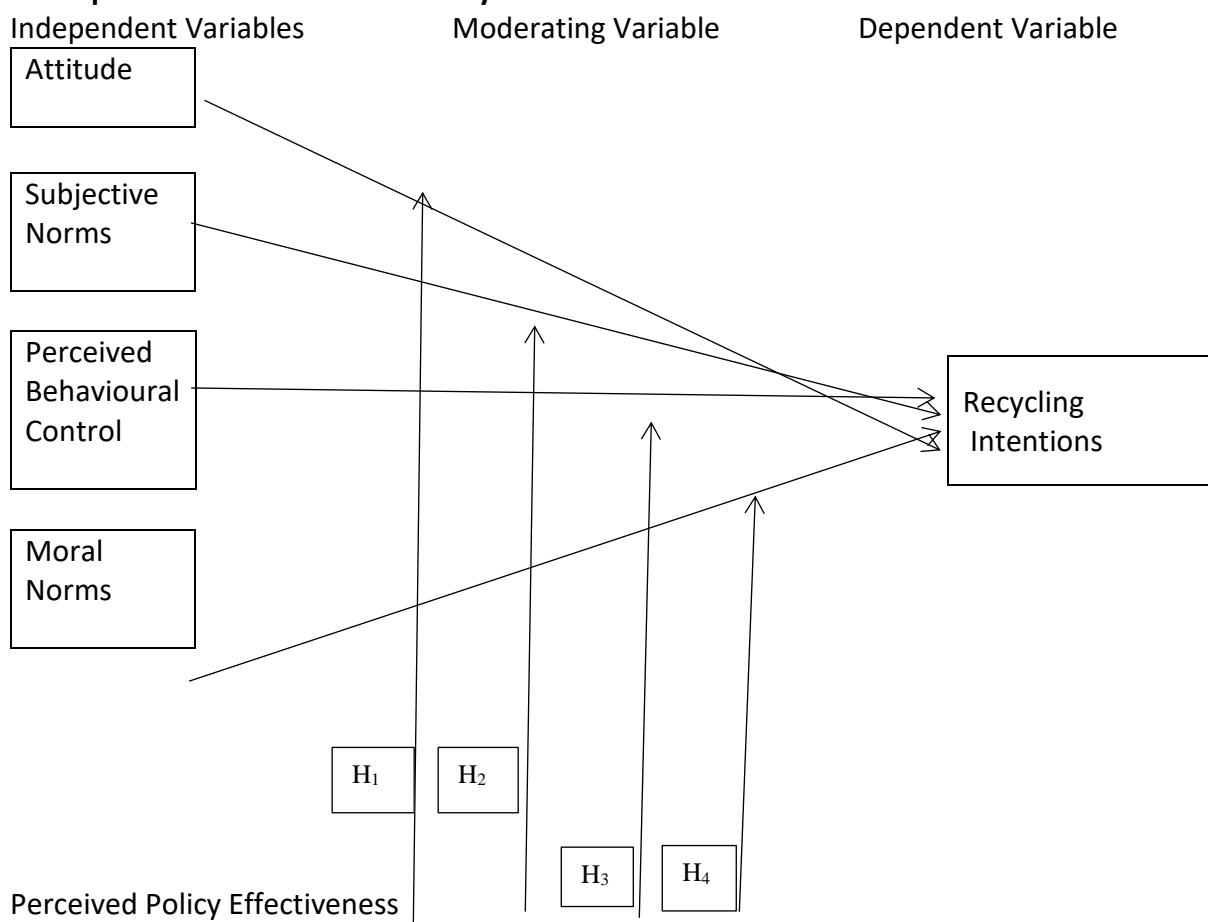


Figure 1: Conceptual framework of the Study

**Research Methodology**

This study employs hypothesis testing to examine the moderating effects on the relationship between independent variables (attitudes, subjective norms, perceived behavioral control, and moral norms) and dependent variable (recycling intention). This study also employs a cross-sectional survey in examining the factors that influence household recycling intentions. The unit of analysis of this study is households who are living at Flat PPR Sri Pantai, Pantai Dalam, Kuala Lumpur. In terms of sample size, Sekaran & Bougie (2010) mentioned that Roscoe had proposed rules of thumb for determining sample size. The sample size is larger than 30 and less than 500 respondents are suitable for most research. Thus, this study employed 125 households at Flat PPR Sri Pantai as the respondents of the study. This study also utilized a triangulation method that combines both quantitative and qualitative studies. This method is employed in this study because it helps to strengthen confidence in the research findings (Arksey & Knight, 1999).

**Demographic Profile of the Respondents****Quantitative Data**

Table 1 illustrates the profile of the respondents who participated in the survey. This study comprised 125 respondents who live at Flat PPR Sri Pantai, Pantai Dalam Kuala Lumpur. The descriptive statistics indicate that the majority of respondents were female (73.6%) with the male making up the remaining 26.4 percent. The largest age group was represented by the 40-60 years old range (52%), and most of them have *Sijil Pelajaran Malaysia* (SPM). In addition, most of the respondents' household monthly income (32%) was in the range between RM 1000 - RM 1900. Concerning ethnicity, the majority of them were Malays which accounted for 60 percent, followed by Indians (32.8%) and Chinese (7.2%).

Table 1

*Profile of Respondents for Quantitative Study (N = 125)*

Variable	Frequencies	Percentage (%)
<b>Gender</b>		
Male	33	26.4
Female	92	73.6
<b>Age</b>		
17 and below	7	5.6
18-24	10	8
25-39	35	28
40-64	65	52
65 and above	8	6.4
<b>Highest Education Level</b>		
Primary School	32	25.6
PMR/SRP	31	24.8
SPM	47	37.6
STPM/Matriculation	2	1.6
University/College	7	5.6
No Formal Education	6	4.8
<b>Total Monthly Household Income</b>		
RM 500-999	36	28.8
RM 1000-1999	40	32.0
RM 2000-2999	33	26.4
RM 3000-3999	9	7.2
RM 4000-4999	6	4.8
RM 5000 and above	1	0.8
<b>Ethnicity</b>		
Malay	75	60
Chinese	9	7.2
Indian	41	32.8

#### Qualitative Data

As mentioned earlier, the present study employs triangulation whereby both quantitative and qualitative studies are carried out to produce a robust outcome. Table 2 below illustrates the profile of the respondents for the qualitative study. The first interviewee of this study is one of the heads of households at Flat PPR Sri Pantai. He was chosen for this study because he is a very active person in recycling his household wastes. Through observation that had been made, it was found that he and his family members segregate old newspapers, plastic bottles, and aluminum tins. In addition, his family members have experience in selling recyclable materials to the recycling centers.

The second interviewee of this study is the Chairman of the Residential Association. She is the right person to be interviewed as she is the Chairman of the Residents' Association. She relatively has a vast experience and knowledge of matters about residents at Flat PPR Sri Pantai. Besides that, she has carried out several community programs including the *gotong-royong* program. Therefore, it is believed that she is the right person to give ideas and opinions concerning recycling behavioral intentions among the residents.

Table 2

*Profile of the Interviewees*

No.	Position	Venue
1	Head of Household	Flat PPR Sri Pantai
2.	Chairman of the Residential Association	Pantai Bazarria, Pantai Dalam

**Findings**

The results of a Hierarchical Regression for Moderating Effects analysis are discussed here. Chaplin (1991) and Stone & Hollenback (1984) proposed using hierarchical regression analysis to look at moderating factors. Moderating variable is a third variable that can modify the form and/or strength of the relationship between independent and dependent variables (Hair et al., 2010). A moderated relationship is one in which a variable (Z) interacts with a predictor variable (X) to change the relationship between the predictor and an outcome (criterion) variable (Y) (Villa et al., 2003). Hierarchical regression is a straightforward technique to test the form of the relationship changes with the addition of a moderator (Stone & Hollenbeck, 1984). In other words, hierarchical regression is a mechanism used to examine the interactions among variables to produce moderator effects.

Table 3 depicts the hierarchical multiple regression embarked to examine the moderating effect of perceived policy effectiveness on the relationship between attitude, subjective norms, perceived behavioral control, moral norms, and household recycling intentions. Hierarchical regression analysis is employed to predict the interaction effect through the significance of the R<sup>2</sup> change. There are several steps in analyzing the moderating effect using hierarchical regression. The independent variables (attitude, subjective norms, perceived behavioral control, and moral norms) were first entered into model 1. It is followed by entering independent variables and moderating variables in model 2 and the interaction variables in model 3.

Model 1 represents the constructs of the independent variables and statistically significant regression coefficients. The independent variables entered in model 1 accounted for approximately 26% of the variance in the dependent variable (household recycling intentions). By looking at the significant value, three variables made a significant contribution, which is attitude ( $p < .10$ ), subjective norms ( $p < .01$ ), and moral norms ( $p < .01$ ) meanwhile perceived behavioral control is insignificant. The standard coefficient Beta for attitude ( $\beta = 0.139$ ,  $t = 1.745$ ,  $p < 0.1$ ), subjective norms ( $\beta = 0.259$ ,  $t = 3.131$ ,  $p < 0.01$ ), and moral norms ( $\beta = 0.261$ ,  $t = 3.061$ ,  $p < 0.01$ ) had significant effects on household recycling intentions. This implies that household recycling intentions were believed to increase in a positive direction with attitude, subjective norms, and moral norms.

Model 2 accounted for approximately 27% of the variance in household recycling intentions. It was observed that when the moderating variable was entered into the model, the significant values for independent variables changed slightly. Three independent variables made a statistically significant relationship with the dependent variable which are attitude ( $p < 0.1$ ), subjective norms ( $p < 0.01$ ), and moral norms ( $p < 0.01$ ). A moderator can either have or do not have a significant relationship with the independent variable and dependent variable (Jaccard et al., 1990). The standard coefficient Beta for attitude ( $\beta = 0.134$ ,  $t = 1.683$ ,  $p < 0.1$ ), subjective norms ( $\beta = 0.243$ ,  $t = 2.838$ ,  $p < 0.01$ ), and moral norms ( $\beta = 0.253$ ,  $t = 2.937$ ,  $p < 0.01$ ) had significant effects on household recycling intentions. This shows that the

household recycling intention was predicted to increase in a positive direction with attitude, subjective norms, and moral norms.

Model 3 illustrates the interaction output between attitude, subjective norms, perceived behavioral control, moral norms (independent variables constructs), and perceived policy effectiveness (moderating construct) on household recycling intentions (dependent variable construct). From table 3, it can be seen that the value for  $R^2$  was 34%, an increase of 7% after the interaction terms were entered into the model. It was found that the interaction terms between subjective norms x perceived policy effectiveness ( $\beta = -.444$ ,  $t = -1.721$ ,  $p = .088$ ), perceived behavioral control x perceived policy effectiveness ( $\beta = .557$ ,  $t = 1.719$ ,  $p = .088$ ) and moral norms x perceived policy effectiveness ( $\beta = -.471$ ,  $t = -1.882$ ,  $p = .062$ ) had a moderating effect on household recycling intentions.

It is interesting to mention that in models 1 and 2, perceived behavioral control is reported as not significantly influencing household recycling intentions. However, when the variance is multiplied by perceived policy effectiveness (moderating variable), it turns out to become significant. This is because the variances of perceived behavioral control were different in interaction with the variance of moderator factors (perceived policy effectiveness) which lead to a different effect on household recycling intentions. It is supported by Villa et al. (2003, p.6) who mentioned that "technically, significant interactions may occur without the main effects of the predictor variables". In other words, although an independent variable was not significantly influenced by the dependent variable, its relationship with the dependent variable can be strengthened with the help of moderating variable.

Table 3

*Hierarchical Regression Analysis for Moderating Variable Effect*

Variables	Standardize	t	Sig.
	Coefficients		
Beta			
Model 1			
(Constant)		.984	.327
Attitude	.139	1.745	.084
Subjective Norms	.259	3.131	.002
Perceived Behavioural Control	.125	1.458	.148
Moral Norms	.261	3.061	.003
Model 2			
(Constant)		1.012	.313
Attitude	.134	1.683	.095
Subjective Norms	.243	2.838	.005
Perceived Behavioural Control	.101	1.098	.275
Moral Norms	.253	2.937	.004
Perceived Policy Effectiveness	.071	.764	.446
Model 3			
(Constant)		-.951	.344
Attitude	.423	1.713	.089
Subjective Norms	.685	2.683	.008
Perceived Behavioural Control	-.465	-1.489	.139
Moral Norms	.719	2.806	.006

Perceived Policy Effectiveness	.038	.381	.704
Attitude x Perceived Policy Effectiveness	-.310	-1.244	.216
Subjective Norms x Perceived Policy Effectiveness	-.444	-1.721	.088*
Perceived Behavioural Control x Perceived Policy Effectiveness	.557	1.719	.088*
Moral Norms x Perceived Policy Effectiveness	-.471	-1.882	.062*
	Model 1	Model 2	Model 3
R	.519	.522	.586
R <sup>2</sup>	.269	.273	.344
Adj R <sup>2</sup>	.245	.242	.292
R <sup>2</sup> Change	.269	.004	.071
F	11.054	8.929	6.690
Significant	.000	.000	.000

Note: \*\*\* p < .01, \*\* p < .05, \* p < .10

## Discussion

The moderating variable of this study is perceived policy effectiveness. The first hypothesis of the study postulated that the relationship between attitudes and household recycling intentions will be positively moderated by perceived policy effectiveness. However, the perceived policy effectiveness did not positively moderate the relationship between attitude and household recycling intentions.

This finding supports the finding of the study which carried out by Wan et al. (2014). Although they perceived that the recycling policy is not too effective, the household still carries a favorable attitude towards recycling and they are likely to have high intentions to recycle. This could be due to the households still carry a favorable attitude towards recycling as they believe that by engaging in recycling activities, they can earn some money to finance their daily life. An interviewee explains that;

*"I have participated and I will continue to participate in recycling activities in the future. Although there are not so many environmental programs carried out by local authorities, I still believe that recycling can bring positive consequences to me as well as other people surrounding me. It becomes a part of my source of income. I also noticed that my neighbors sold the recycled materials to recycling collectors. Although the incentive is not so much, it is more or less can help me to buy the necessary goods like rice, sugar, and so on. Besides that, by engaging in recycling activities, we can help to preserve the environment. I don't like people to place their rubbish arbitrarily. Normally, the children love to place the rubbish in the corridors, stairs area, and near the lift. We need to address this kind of problem!"* - The Head of Household.

Based on the explanation above, it is believed that the household still has a favorable attitude towards recycling intentions without the effect of moderating variables such as perceived policy effectiveness.



In addition, the second hypothesis predicted that the relationship between subjective norms and household recycling intentions will be negatively moderated by perceived policy effectiveness. The findings of this study support the second hypothesis and it is in line with the finding of the study by Wan et al. (2014). According to Wan et al. (2014), if a government formulates and implements effective policy measures to encourage and facilitate recycling, the social influence (subjective norms) would become less important. In other words, the existence of an effective policy will weaken the relationship between subjective norms and household recycling intentions. Wan et al. (2014) further explained that when an individual is motivated by policy measures, the impact of his/her social groups would have a lower impact on the recycling intention.

This is because subjective norms are effective to influence household recycling intentions, but only in the early or the introductory stage of recycling policy. When the government policy has been introduced and implemented for a long time, the subjective norms will become less dominant to influence household recycling intentions. This indicates that the effect of subjective norms on recycling intentions would decrease with any increase in perceived policy effectiveness. This is due to a policy measure serves as a motivational device (Wan & Shen, 2013). This situation can be explained by an interviewee;

*“Recycling policy and program are vital in encouraging residents to engage in recycling activity. This is because the residents who will come to the recycling program will get more knowledge and awareness of the consequence of recycling. They will feel like the government is very enthusiastic and put more efforts to encourage residents to recycle. Therefore, they will be motivated to engage in recycling activities. But, the promotions to encourage the residents to join the program must be effectively done. Perhaps, the DBKL officers with the help of community members and NGOs can collaborate and induce the residents to join the recycling program and activity. Maybe, they can do this by visiting households from unit to unit. However, this can be done at the introductory stage of the policy program. When the recycling program is effective, then, the collaboration parties do not need to go unit to unit to induce residents to join the recycling program as they are already motivated to join the program” – The Chairman of the Residential Association.*

Concerning the third hypothesis, this study projected that perceived policy effectiveness will have a positive moderating effect on the relationship between perceived behavioral control and household recycling intentions. To recap, this study found that there is no significant relationship between perceived behavioral control and household recycling intentions. However, the perceived policy effectiveness can moderate the relationship between the perceived behavioral control and household recycling intentions. In other words, the perceived policy effectiveness moderates the relationship between perceived behavioral control and household recycling intentions. This is because perceived behavioral control and perceived policy effectiveness are regarded as intrinsic and extrinsic motivational factors respectively. Since perceived policy effectiveness serves as an extrinsic motivational factor, then, it strengthens the relationship between perceived behavioral control and behavioral intentions (Wan et al., 2014). An interviewee contends that;

*“We know that, here, there are no recycling bins provided to us. That explains why some residents here do not participate in recycling activities. Those who are looking for money, still want to recycle. But, those who are not money oriented, will still keep their recyclable materials and wait for somebody to collect the materials. If the government conducts recycling programs, educates the residents that recycling is good, gives incentives to us, provides recycling bins, and makes a big promotion for recycling programs, I think they will be more residents to participate in recycling activity. The DBKL should come out with a recycling program if they want the residents to participate in recycling activities. If the number of residents who recycle is high, we will not hear the problem of improper waste management at this flat”. – The Head of the household.*

Based on the above explanation, it is believed that recycling policy can strengthen the relationship between perceived behavioral control and household recycling intentions. By having recycling policies and programs (campaigns, education, recycling facilities, etc.), the residents are more encouraged to recycle their household materials.

The fourth and last hypothesis of the study postulated that perceived policy effectiveness will have a negative moderating effect on the relationship between moral norms and household recycling intentions. The result of this study supports the fourth hypothesis. In other words, perceived policy effectiveness will have a negative moderating effect on the relationship between moral norms and household recycling intentions. This finding is similar to the finding of the study by Wan et al. (2014). Wan et al. (2014) contended that the nature of moral norms is similar to subjective norms. They further explained that the normative influence would be more essential at the introductory stage of recycling policy, the time when people would follow the perceived moral norm to perform the socially desirable behavior. When a public authority effectively and adequately motivates and facilitates recycling behavior, the influence of moral norms on recycling intentions would become weaker. This idea was shared by one of the interviewees who explains that;

*“We as residents may feel it is our social responsibility to recycle household wastes. We believe that recycling is a good thing to do (morally correct activity). Definitely! But if there is a recycling policy and program in this area, of course, it will motivate us more to recycle. As for now, there is no recycling policy or program. I mean, we do not have a specific recycling program. During gotong-royong, we do have separate wastes in the public areas. But it was indirectly being done because the main focus is to clean up the flat area. Not specifically focused on segregating the wastes. But, yeah, if the government provides programs like giving incentives, providing recycling bins, and so on, it will boost the recycling rate among the residents here. We will feel obliged to come to the recycling program (awareness program on recycling)”- Chairman of Residential Association.*

## **Conclusion**

To recap, there are four hypotheses developed to measure the moderating effect on the relationship between independent variables (attitude, subjective norms, perceived behavioral control, and moral norms) and dependent variable. The moderating variable of this study (perceived policy effectiveness) is predicted to positively moderate the relationship

between attitude and recycling intentions and between perceived behavioral control and recycling intentions. On contrary, the moderating variable of this study is predicted to negatively moderate the relationship between subjective norms and recycling intentions and between moral norms and recycling intentions.

Among four hypotheses, the perceived policy effectiveness only has moderating effects on subjective norms, perceived behavioral control, and moral norms. Specifically, the perceived policy effectiveness is found to positively moderate the relationship between perceived behavioral control and recycling intentions. Meanwhile, the perceived policy effectiveness negatively moderates the relationship between subjective norms and recycling intentions and between moral norms and recycling intentions. As explained in the previous section, the subjective norms and moral norms that influence recycling intentions will be weaker when the authority introduces a recycling policy. This is because the policy serves as a powerful motivational factor that overrides both subjective norms and moral norms. Besides that, both subjective norms and moral norms serve only at the introductory stage of the recycling policy or program.

This study also attempts to contribute substantively to the empirical data related to household recycling behavioral intentions. Since there is a limited study concerning household recycling intentions at PPR Sri Pantai, the present study is able to address the gap in knowledge by examining household recycling intentions at Flat PPR Sri Pantai, Pantai Dalam, Kuala Lumpur similarly to the previous researchers who have studied the recycling intentions of several targeted respondents. It is hoped that the moderating effect of the study can provide significant information for future researchers. Hence, it will help future researchers in reviewing the literature on recycling intentions in Malaysia. Furthermore, based on both the theoretical and empirical contributions mentioned, this study is essential to provide a practical contribution to government agencies. It would enable Dewan Bandaraya Kuala Lumpur to formulate a sound recycling policy, especially for households at Flat PPR Sri Pantai.

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