

## Solid Waste Management and Recycling Practices among PPR Sri Pantai Residents: A Move towards Sustainability

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### Abstract

Many urban regions, including those in the Association of Southeast Asian Nations (ASEAN) countries, have identified waste management as a major environmental issue. Even though Malaysia's recycling rate has increased from 21% to 24.6%, it still lags well behind the world leader, Germany, which has a recycling rate of 56%. It is crucial that recycling be promoted in Malaysia because of the many positive effects it has on the environment. Against the backdrop of Malaysia's dismally low recycling rate, this research aims to investigate the factors influencing recycling intention among residents of Flat P.P.R Sri Pantai, Kuala Lumpur. This study uses a cross-sectional survey design to investigate what characteristics are associated with recycling behavior at the residential level. Households in PPR Sri Pantai, Pantai Dalam, Kuala Lumpur, are the unit analysis of the study. This study employs a correlation approach as it examines the relationship between independent variables (attitudes, subjective norms, perceived behavioral control, moral norms, and perceived policy effectiveness) and the dependent variable (recycling intention). The results revealed that the independent variables such as attitude, subjective norms, and moral norms significantly influenced the household recycling intentions. Taking into account people's environmental worries and their views on the risks posed to their personal information, this research has important theoretical and practical implications for changing recycling habits. The study's findings could potentially be used as a reference by policymakers and the Department of Environment as they formulate recycling initiatives to improve the long-term viability of urban neighborhoods.

**Keywords:** Environment, Recycling, Recycling Intention, Solid Waste Management, Sustainable Practices

## Introduction

The substantial growth of solid waste and its management is a universal concern. Governments have developed various legislation and program to address this issue and promote recycling behavior among their citizens with the hope of decreasing the amount of waste ending in landfill sites and incinerators (Haj-Salem & Al-Hawari, 2021). Widespread consensus exists that the greatest challenges of the 21st century are climate change, landfills, the unpredictability of future fossil fuel availability, and the enormous quantity of carbon emissions (Sang & Bekhet, 2015). 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. In metropolitan regions, solid-waste management presents a unique difficulty for any government. Rapid population growth and urbanization have resulted in a lack of available areas for garbage dumps, making the disposal of garbage a challenge in many cities (Moh & Latifah, 2014; Kaosol, 2009).

Many cities, including those in the ASEAN, have identified waste management as one of their top environmental concerns (Mohapatra, 2013). Over the past few decades, the amount of garbage produced by Malaysian households has skyrocketed. Approximately 80% of MSW is comprised of recyclable materials, making up 64% of total garbage (Moh & Abd Manaf, 2017). Reduce, reuse, and recycle are three ways in which public policies for the management of urban solid waste help conserve scarce natural resources (Bruno et al., 2022). According to Chen & Thung (2010), recycling has an edge over landfill diversion since it not only decreases landfill waste but also repurposes its raw materials into useful new products.

The Sustainable Development Goals, set by the United Nations, place particular emphasis on recycling efforts (Juliana et al., 2022). The environmental benefits of recycling include lowering emissions, decreasing the need for landfill space, and conserving natural resources and power (Zhang et al., 2017). Many underdeveloped countries recycle just between 1% and 3% of their garbage, whereas the OECD reports that the average recycling rate is 22%. (Thoo et al., 2021). Even though Malaysia's recycling rate has increased from 21% to 24.6%, it still lags well behind the world leader, Germany, which has a recycling rate of 56%. (The Star, 2019). Singapore and South Korea have a higher recycling rate than any other Asian country at 34% and 53.7 percent, respectively (Department of Statistics Malaysia, 2020).

According to the Malaysian Ministry of Health, few people are concerned about protecting their environment (Abas, 2019). The low recycling rate in Malaysia can be attributed to the country's citizens' lack of education on the 3Rs program, which encourages citizens to cut back on their use of nonrenewable resources, find new uses for old items, and recycle those items once their useful life has come to an end (Thoo et al., 2021). With Malaysia's dimly low recycling rate as a backdrop, this article aims:

1. To examine factors influencing recycling intention among residents of Flat P.P.R Sri Pantai, Kuala Lumpur.
2. To identify the most significant factor that influences recycling intention among residents of Flat P.P.R Sri Pantai, Kuala Lumpur.

**Literature Review***Attitudes*

One definition of attitude is a person's overall assessment of a person's behavior (Chang et al., 2022). Attitude is the degree to which individual values or disvalues a given activity, as described by (Ajzen, 1991); Yuzhanin & Fisher, 2016). A person's attitude can be defined as their level of inclination, either positive or negative, toward an action (Nguyen et al., 2019). Attitude has been shown to positively correlate to any behavior in several studies (Pakpour et al., 2014; Nguyen et al., 2019).

Individual attitudes are formed based on whether the action is right or wrong, good or terrible, useful or ineffective, desired or undesirable, pleasurable or unpleasant, and intriguing or uninteresting (Ramayah, 2012). Meanwhile, perceptions about the repercussions of behavior, such as the cost and utility of the behavior, determine attitudes (Lange et al., 2014). In other words, a person will evaluate a recycling action to see whether it is appropriate, beneficial, and beneficial to him or her, other people, and the environment.

More positive behavior intention is formed when an individual has a favorable attitude toward the conduct. In contrast, having a negative attitude results in poor behavioral intentions (Ding et al., 2021). People's attitudes are crucial elements in their decision to engage in pro-environmental activities (Yatish et al., 2021; Oteng-Peprah et al., 2020). Furthermore, in the consumer waste recycling study, the beneficial influence of attitude on recycling intention is usually large (Aboelmaged, 2021; Jain et al., 2020). Shimbar (2021) indicated that mindset is the most important element influencing people's intentions to recycle e-waste. Understanding individual attitudes toward recycling intentions are critical for developing effective recycling programs (Afroz et al., 2010) and encouraging families to participate in recycling (Singhirunnusorn et al., 2012). Several researchers discovered that an individual's attitude favorably motivated respondents to recycle waste goods (Ittiravivongs, 2012).

It shows that respondents' attitudes regarding recycling were related to their plans to engage in recycling behavior. This is because participants in such research believe that recycling allows them to reduce the number of unwanted goods in landfills while also helping to maintain the environment (Ramayah, 2012). Households that strongly believe in the benefits of recycling are more likely to participate in a recycling program (Harland et al., 2007). The more positive thoughts someone holds, the more likely they are to carry out that activity (Zhang et al., 2020). People who are more concerned about the environment may have more favorable opinions regarding recycling (Jain et al., 2020). These sentiments will subsequently impact their intention to recycle (Liu et al., 2022). Hence, the following hypothesis is proposed:

H1: Attitude towards recycling will significantly influence household recycling intentions.

*Subjective Norms*

Subjective norms are societal influences or pressures that encourage a person to perform or refrain from acting (Ajzen, 1991; Yuriev et al., 2020). Subjective norms are described as a person's intention to perform a specific behavior in response to the

expectations of others (Kochan et al., 2015) and can be influenced by one's social circle and immediate surroundings in society (Singh et al., 2018). Subjective norms are a social injunctive norm since it is concerned with perceived social pressures from important people (family, friends, and neighbors) to undertake particular types of behavior, in this case, recycling (White et al., 2009).

Several empirical investigations discovered that people's subjective norms influenced their intentions to recycle (Ramayah, 2012; Mahmud & Osman, 2010; Cheng & Tung, 2009). When people in society and the government have favorable views or ideas about specific actions, it influences individuals' positive behavioral intentions (Khan et al., 2019; Piazza et al., 2019). Individuals were more inclined to participate in recycling activities, according to Valle et al (2005), since they were significantly impacted by the person they believed to be highly important to them. Furthermore, Carlson (2001) argued that recyclers will have an innate drive to engage in environmentally responsible behavior if their significant others, such as friends and neighbors, approve of it.

According to McAdams (1997), committing to recycling will result in feelings of pride or esteem if the community encourages or permits recycling behavior. Individuals may also experience shame or loss of self-esteem if they do not participate in recycling activities. Individuals will be persuaded to recycle and their views of the costs of recycling will be minor if the community's norms for recycling are strong enough, according to (McAdams, 1997). Individuals from various groups agreed that subjective norms are positively connected with recycling intentions. As a result, the following hypothesis is reached:

H2: Subjective norms will significantly influence household recycling intentions.

### *Perceived Behavioural Control*

Perceived Behavioural Control (PBC) is defined as an individual's belief in one's own ability to carry out certain conduct effectively (Cho, 2019; Yuriev et al., 2020). Several studies have found a beneficial relationship between PBC and behavioral intention (Lizin et al., 2017; Botetzagias et al., 2015). According to Fang & Zhang (2019), PBC has a considerable impact on lurkers' intention to continue participating. Ramayah et al (2012) classified perceived behavior control into two components: the ease of access to recycling infrastructure and the cost of recycling. Inconvenience is consistently regarded as a key obstacle to recycling, whereas convenience is cited as a major motivator for recyclers (Perrin & Barton, 2001). Siddique et al (2010), on the other hand, divided the cost of recycling into numerous components, including the amount of time available for recycling, the amount of space available for recycling, and the simplicity of recycling.

To enhance household recycling participation, it is required to make recycling more convenient, as such activity is claimed to require time, space, money, and effort (Sidique et al., 2010). Recycling behavior is influenced by characteristics such as ease of use, as simple, quick, and space-efficient recycling devices (Davis & Morgan, 2008). Situational factors (physical elements that may support or hinder recycling) emerged as the most powerful predictors of recycling behavior (Davis et al., 2006). Previous research indicated that individuals' perceived behavioral control greatly influenced recycling intentions and behavior (Knussen et al., 2004; Tekkaya, et al., 2011; Ittiravivongs 2012; Ramayah, 2012; Ioannou et al., 2011; Mahmud & Osman, 2010; White et al., 2009). According to the above remarks,

perceived behavioral control can be described as an individual's view of the simplicity of recycling and their likelihood to participate in recycling activities.

Personal reward/loss has been shown to have a stronger influence on behavior than other non-monetary considerations such as convenience and ease of use (Miller Associates, 1999). The existence of an effective recycling infrastructure that allows residents to recycle their garbage is certainly a critical component of any recycling program (Martin et al., 2006). Chen & Tung (2010) discovered that respondents' recycling intentions decreased when they realized there were no suitable recycling facilities at their workplaces. In contrast, Abdul Latif et al (2013) stated that enhanced and convenient recycling facilities could increase people's recycling intentions and frequency. As a result, the following theory is proposed:

H3: Perceived behavioral control will significantly influence household recycling intentions.

#### *Moral Norms*

Moral norms are a person's assessment of whether a given behavior is morally correct or improper. Recent research has introduced moral norms to the enlarged TPB to investigate recycling behavior (Aboelmaged, 2021; Lizin et al., 2017). Moral norms are internalized moral guidelines that lead to self-approval or disapproval, as well as thoughts about whether specific activities are morally proper or wrong (Parker et al., 1995; Schwartz, 1977). According to Kaiser (2006), moral norms are personal opinions about the moral correctness or incorrectness of certain behaviors.

Although the theory of planned behavior is deemed significant in predicting respondents' recycling intentions, it has been critiqued for failing to incorporate moral issues (Manstead, 2000). Furthermore, according to Conner & McMillan (1999), an additive component such as morality can greatly increase an individual's behavioral intentions on particular issues. Kaiser & Scheuthle (2003) discovered that moral norms influence individuals' intentions to engage in a conservative activity such as recycling in addition to attitudes, subjective norms, and perceived behavioral control. Furthermore, Hage et al. (2009) show that moral norms are important in affecting Sweden's households' recycling behavior intentions for all packaging materials such as paper, plastic, glass, and metal in their empirical findings. Furthermore, Frey (1999) believed that people usually recycle as a result of moral concerns.

Tang et al (2011) discovered that individuals with high moral standards are more likely to engage in recycling activities in their households recycling research in Hunan, China. Furthermore, White et al (2009) discovered that moral norms influenced household recycling intentions. According to the preceding debates, various researchers from earlier studies discovered that moral norms strongly influenced recycling intentions among their particular subjects. Therefore, the following hypothesis is proposed:

H4: Moral norms will significantly influence household recycling intentions.

#### *Perceived Policy Effectiveness*

A measure's perceived policy effectiveness refers to an individual's positive or negative opinion of a given policy measure (Wan et al., 2014). They also stated that an individual will assess the policy based on the clarity, sufficiency, and ease of implementation of policy measures. Schneider & Ingram (1990) argue that policy can be used to motivate people to

modify their behavior. However, there has been little research into how people's intentions to conduct certain behaviors are influenced by the perceived effectiveness of policy measures (Wan et al., 2014). As a result, this study integrates households' perceptions of the recycling policy's perceived effectiveness to investigate its relationship with their recycling intentions. This is critical because it allows local governments to tighten their recycling policies.

According to Wan & Shen (2013), if the government's policy is regarded to be effective, an individual will be encouraged to have a higher level of intention to conduct a given behavior. According to the study's findings, an individual will be induced to participate in recycling activities if they believe the recycling policy is effective. Wan et al (2014) attempted to include perceived policy efficacy as a variable in their study. There was a strong association discovered between respondents' perceived policy efficacy and recycling intentions. In other words, if households believe that the recycling strategy is effective, they will be more likely to recycle. As a result, the following hypothesis is proposed:

H5: Perceived policy effectiveness will significantly influence household recycling intentions.

### **Research Methodology**

The hypothesis testing method was used in this study to investigate the association between independent factors (attitudes, subjective norms, perceived behavioral control, moral norms, and perceived policy effectiveness) and dependent variable (recycling intentions). Several earlier studies on recycling are used and recognized to establish the hypotheses. The study's findings are utilized to determine whether they support the previously formulated hypothesis statements. The factors that influence household recycling intentions are investigated using a cross-sectional survey in this study. This study's unit of analysis is a household in PPR Sri Pantai, Pantai Dalam, Kuala Lumpur.

The correlation approach is used in this study to investigate the link between independent variables (attitudes, subjective norms, perceived behavioral control, moral norms, and perceived policy effectiveness) and the dependent variable (recycling intentions). According to Sekaran & Bougie (2010), Roscoe suggested rules of thumb for selecting the sample size. Most studies require a sample size of more than 30 and fewer than 500 responders. Therefore, 125 houses at Flat PPR Sri Pantai were used as questionnaire respondents in this study. This is because 125 households are more than 90 respondents, whereas the range specified by Roscoe is between 30 and 500 respondents.

### **Findings**

#### *Goodness of Measures*

In terms of reliability of the measurements, Cronbach's Alpha test shows that all items under independent variables and the dependent variable were reliable (>0.06).

Table 1

*Reliability Results*

| Items                          | Cronbach's Alpha | N  |
|--------------------------------|------------------|----|
| <b>Independent Variables</b>   |                  |    |
| Attitude                       | .816             | 10 |
| Subjective Norms               | .817             | 6  |
| Perceived Behavioural Control  | .798             | 8  |
| Moral Norms                    | .788             | 6  |
| Perceived Policy Effectiveness | .798             | 6  |
| <b>Dependent Variable</b>      |                  |    |
| Recycling Intentions           | .783             | 5  |

The normality test through skewness and kurtosis is utilized to examine the distribution of the data. According to Coakes & Ong (2011), there are alternatives to measure the normality of the data, whether to present the results graphically or use a statistical number. This study chooses the statistical number method to present the normality results. Hence Skewness and Kurtosis are used to measure the normality of the data. According to Brown (2021), the range of +3 and -3 are acceptable values for Skewness, and the range of +10 and -10 are acceptable values for Kurtosis. Table 2 shows the normality results of the variables. All variables of the study are found to be normal since the values of Skewness and Kurtosis are within the normality range specified by (Brown, 2021).

Table 2

*Normality Results*

| Constructs                     | Skewness | Kurtosis |
|--------------------------------|----------|----------|
| <b>Independent Variables</b>   |          |          |
| Attitude                       | -1.219   | 3.622    |
| Subjective Norms               | -.094    | -.597    |
| Perceived Behavioural Control  | -.180    | .148     |
| Moral Norms                    | .093     | .057     |
| Perceived Policy Effectiveness | .207     | -.546    |
| <b>Dependent Variable</b>      |          |          |
| Recycling Intentions           | .147     | -.452    |

*Demographic Profile of Respondents*

The characteristics of the survey takers are displayed in table 3. There were 125 participants from the Flat PPR Sri Pantai in Pantai Dalam, Kuala Lumpur, involved in this survey. Before any data were collected, participants were briefed on the study's goals and how it would benefit the local community.

According to the breakdown provided by the descriptive data, the majority of respondents (73.6%) were female, while just 26.4% were male. Fifty-two percent of the population fell between the ages of 40 and 60, and the vast majority of those people had the Sijil Pelajaran Malaysia (SPM). Among those who participated, married individuals accounted

for the majority (66.8%), with the majority of these individuals (43.2%) being housewives. More than half of the respondents (53.6%) had four or more people living in their homes, and most of their monthly income (32%) was in the range of RM1000 to RM1900. Sixty percent were Malays, followed by 32.8% Indians and 5% Chinese (7.2 percent). Ethnic breakdown in this survey mirrored that of the residents of Flat PPR Sri Pantai, where Malays (62.37%), Indians (30.33%), and Chinese (3.61%) make up the majority of households (7.3%). Table 3 shows that 53.6% were located on the lower floor while 46.4% were on the upper floor.

Table 3

*Demographic Profile of Respondents*

| 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>Occupational Sector</b>            |             |                |
| Government                            | 4           | 3.2            |
| Private                               | 30          | 24.0           |
| Own Business                          | 21          | 16.8           |
| Housewife                             | 54          | 43.2           |
| Student                               | 10          | 8.0            |
| Pensioner                             | 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           |
| <b>House level</b>                    |             |                |
| Lower floors (levels 1-10)            | 67          | 53.6           |
| Upper floors (level 11 and above)     | 58          | 46.4           |



### Correlation Analysis

The study's bivariate results are presented in table 4 below. It is assessed to examine the link between the study's independent variables (attitude, subjective norms, perceived behavioral control, moral norms, and perceived policy effectiveness) and the dependent variable (household behavioral recycling intentions). This section only discusses independent variables that have substantial correlations with the dependent variable as well as among independent variables.

In terms of the link between independent factors and dependent variables, table 4 shows that all of the study's independent variables are significantly connected with the dependent variable. The correlation results show that attitude is related to household recycling intentions ( $r = .491$ ,  $p = 0.01$ ). Subjective norms ( $r = .439$ ,  $p = 0.01$ ), perceived behavioural control ( $r = .523$ ,  $p = 0.01$ ), moral norms ( $r = .637$ ,  $p = 0.01$ ), and perceived policy effectiveness ( $r = .504$ ,  $p = 0.01$ ). These correlation findings indicated that families in Flat PPR Sri Pantai, Pantai Dalam employ more than one dimension (factor) before establishing recycling intention.

The correlation analysis demonstrates that there was a link between attitude and recycling intentions. This could be because the majority of families believe that recycling can help to conserve the environment and preserve natural resources. Aside from that, they are enthusiastic about recycling. Given these circumstances, they aim to engage in the recycling effort. It demonstrates a link between subjective norms and recycling intentions in terms of subjective norms. This occurs because the key people in their lives, such as family members, neighbors, and friends, affect their intentions to participate in recycling activities. In other words, significant people like family members, neighbors, and friends urged them to make recycling plans.

The correlation results for perceived behavioral control demonstrate that there is a substantial association between perceived behavioral control and recycling intentions. This is because the bulk of them believe that participating in recycling activities is handy for them. Meanwhile, it has been discovered that moral norms have a substantial association with recycling intentions. This is because the majority of them feel obligated to participate in recycling activities. Last but not least, perceived policy effectiveness is also found to have a significant relationship with recycling intentions as they perceived that the government policy helps them to participate in recycling.

Besides examining the relationship between independent variables and the dependent variable, this section also presents the relationship among the independent variables. The correlation test findings demonstrate that the majority of the variables in this study are significantly connected. Attitude is found to be significantly connected with subjective norms, perceived behavioural control, moral norms, and perceived policy efficacy, with significant values ( $r = .318$ ,  $p = 0.01$ ), ( $r = .386$ ,  $p = 0.01$ ), ( $r = .503$ ,  $p = 0.01$ ), and ( $r = .346$ ,  $p = 0.01$ ).

Although bivariate analysis gives useful information about the relationship between independent factors and dependent variables, Cohen (1988) believes that bivariate correlation results are limited since they focus on the strength of the relationship between small to medium size effects. Thus, the multiple regression analysis is necessary to examine

whether the independent variables of the study influence household recycling intentions. Multiple regression, according to Coakes & Ong (2011), is an extension of bivariate correlation that yields the best prediction of a dependent variable from numerous independent variables.

Table 4

*Pearson Correlation Results*

| Variables                     |                     | Recycling Intention |
|-------------------------------|---------------------|---------------------|
| Attitude                      | Pearson Correlation | .491**              |
|                               | Sig. (2-tailed)     | .000                |
|                               | N                   | 125                 |
| Subjective Norm               | Pearson Correlation | .439**              |
|                               | Sig. (2-tailed)     | .000                |
|                               | N                   | 125                 |
| Perceive Behavior Control     | Pearson Correlation | .523**              |
|                               | Sig. (2-tailed)     | .000                |
|                               | N                   | 125                 |
| Moral Norms                   | Pearson Correlation | .637**              |
|                               | Sig. (2-tailed)     | .000                |
|                               | N                   | 125                 |
| Perceive Policy Effectiveness | Pearson Correlation | .504**              |
|                               | Sig. (2-tailed)     | .000                |
|                               | N                   | 125                 |

*Multiple Regression Results*

Coakes & Ong (2011) mentioned that multiple regression analysis is employed when independent variables are correlated with each other as well as with the dependent variable. Regression models comprise standard, hierarchical, and stepwise regression. This study employs standard multiple regression to examine the relationship between independent variables (attitude, subjective norms, perceived behavioral control, moral norms, and perceived policy effectiveness) and dependent variable (household recycling intentions).

Table 5 presents the unstandardized regression coefficients or slopes (B), the intercepts, standardized regression coefficients or beta weights ( $\beta$ ), the multiple correlation coefficients (R), and the coefficient of determinations ( $R^2$ ) of the results. The table depicts the influence of all independent variables on household recycling intentions. The regression results show that the linear combination of the five independent variables significantly predicts household recycling intentions,  $R^2 = .511$ ,  $F = 24.91$ ,  $p < .01$ . This model accounts for 51% of the variance in household recycling intentions. The F ratio of 24.91 is statistically significant at the 1% level. The model is considered efficient in predicting recycling intentions among households at Flat PPR Sri Pantai, Pantai Dalam.

The results of multiple regression analysis show that only three of the five independent variables significantly influenced household recycling intentions. Attitude, subjective norms, and moral norms were the three independent variables that significantly influenced household recycling intentions. The attitude toward household recycling intentions is considerably changed, with a p-value of .095, which is significant at the 10% level. Subjective norms are also significantly influenced by household recycling intentions, with a p-value of

.005, which is less than .01 and significant at the 1% level. Furthermore, moral norms had a considerable influence on household recycling intentions, with a p-value of .004, which is smaller than .01 and significant at the 1% level.

Based on those findings, it is considered that independent variables such as attitude, subjective norms, and moral norms influenced household recycling intentions significantly. According to the regression results, households at Flat PPR Sri Pantai used these three dimensions to develop their recycling intentions. In other words, there are three variables that the household considers before deciding to recycle: attitude, subjective norms, and moral norms. The beta weights show that moral norms had the greatest influence on household recycling intentions among these three independent variables. It is then followed by subjective norms and, last, attitude. As a result, hypotheses 1, 2, and 4 are accepted, whereas hypotheses 3 and 5 are rejected.

Table 5  
*Multiple Regression Results of the Study*

|  | <b>B</b> | <b>S.E</b> | <b>β</b> | <b>t</b> | <b>Sig.</b> |
|--|----------|------------|----------|----------|-------------|
| (Constant)                                     | .326     | .322       |          | 1.012    | .313        |
| Attitude                                       | .261     | .155       | .134     | 1.683*   | .095        |
| Subjective Norms Perceived Behavioural Control | .194     | .069       | .243     | 2.838*** | .005        |
| Moral Norms                                    | .097     | .089       | .101     | 1.098    | .275        |
| Perceived Policy Effectiveness                 | .228     | .078       | .253     | 2.937*** | .004        |
|  | .054     | .071       | .071     | .764     | .446        |
| R <sup>2</sup> = .511                          |          |            |          |          |             |
| R = .715                                       |          |            |          |          |             |
| F-value = 24.913                               |          |            |          |          |             |

## Discussion

The first hypothesis predicted that recycling attitudes would have a considerable influence on household recycling intentions. According to Pieters (1989), attitudes toward recycling are founded on key ideas about the benefits of the behavior. Attitudes have been researched in social psychology as a major predictor of recycling behavior (Davies et al., 2002). Previous research has shown that if an individual has a good attitude toward a particular behavior, he or she will engage in that behavior (Ajzen & Fishbein, 1985).

This study's multiple regression results revealed that the variable attitude had a substantial influence on household recycling intentions. This finding is consistent with (Norton et al., 2017; Cheng & Tung, 2009; Nigbur et al., 2010; Tekkaya et al., 2011; Davis & Morgan, 2008; White et al., 2009; Ioannou et al., 2011; Davis & Morgan, 2008; White et al 2013). In a study on New York citizens' recycling intentions, Liu et al (2022) discovered that attitude toward recycling strongly influenced recycling intention. Cho (2019) discovered that attitude influences college students' intentions to participate in campus recycling in a big and beneficial way.

Davies et al (2002) argue that to understand people's attitudes, researchers must investigate why people participate in recycling activities. Bagozzi & Dabholkar (1994) investigated several reasons why people want to recycle, including reducing waste, reusing materials, saving the environment, avoiding landfills, saving resources, conserving energy, reducing pollution, improving the aesthetic nature of the land, saving/earning money, reducing trash, and helping the economy.

Taylor & Todd (1995) also explained both personal and social benefits that influenced individuals' attitudes toward waste minimization behavior. Personal benefits include monetary savings, whereas social benefits include environmental preservation, pollution reduction, and resource conservation. They felt that personal and social advantages influenced people's attitudes. Similarly, Chu & Chiu (2003) discovered a positive relationship between attitude and personal and social benefits. Although both advantages influenced an individual's attitude toward recycling plans, it was discovered that the social advantage was more frequent than the personal advantage (Chu & Chiu, 2003). According to the explanations above, urban poor residents may recycle their domestic garbage to produce or supplement their income. The same may be said for the family at Flat PPR Sri Pantai. They are enthusiastic about recycling since it could provide them with more revenue to help them get by.

The study's second hypothesis predicted that subjective norms would have a considerable influence on household recycling intentions. This study discovered that subjective norms strongly influenced household recycling intentions. This discovery is consistent with the findings of earlier researchers (Ding et al., 2021; Wan et al., 2017; Chu & Chiu, 2003). In a study on New York citizens' recycling intentions, Liu et al (2022) discovered that subjective norms strongly influenced recycling intention.

According to Oom do Valle et al (2004), individuals are more likely to undertake a given behavior if influential persons such as friends, family members, or neighbors urge them to do so. Chen & Tung (2010) discovered that if the majority of persons significant to him/her believe that recycling is important, he/she is more likely to recycle. It has been discovered that subjective norms fluctuate depending on the cultural setting. Takiyama (2008) contends that the effect of subjective norms differs between individual culture and collectivist culture. Subjective norms and social attitudes were more likely to be higher in people from collectivist cultures (White et al., 2009). Collectivism prioritizes group goals over individual goals and in-group unity, and it defines the self in the group (McCarty & Shrum, 2001). According to the preceding arguments, citizens in collectivist countries have higher subjective norms than people in individualist countries.

The study's third hypothesis proposed that perceived behavioral control would considerably influence household recycling intentions. Surprisingly, perceived behavioral control was not shown to be connected with household recycling intentions. The findings of this study back up the findings of the previous study (Wang et al., 2021; Mak et al., 2019). In a study of New York citizens' recycling intentions, Liu et al (2022) discovered that perceived behavioral control strongly influenced recycling intention.

According to Knussen et al (2004), a lack of recycling facilities influences the relationship between perceived behavioral control and recycling intentions. It is, however, different in the

setting of a household in PPR Sri Pantai. Although there are no recycle bins in their housing area, for example, the majority of them would like to participate in recycling activities since they can sell reusable products to recycling centers and recyclable collectors.

In the literature, the terms moral norms, personal norms, and moral responsibility are sometimes used interchangeably. Moral norms, according to Kaiser (2006), are a significant precursor of conservation attitudes. Moral Norms are individuals' beliefs about the moral correctness or incorrectness of a particular behavior (Chen & Tung, 2010). According to Chen & Tung (2010), garbage recycling is a behavior that combines personal morality and social responsibility. Consumers will be more motivated to recycle waste if they sense a higher level of moral norms and better-perceived consequences of recycling.

The study's hypotheses indicated that moral norms would have a considerable influence on household recycling intentions. According to the findings of this study, moral norms have a significant influence on household recycling intentions. In other words, households in PPR Sri Pantai who are prepared to recycle believe it is their social responsibility to protect the environment. The finding is consistent with the findings of Miliute-Plepiene et al (2016), who discovered that activating moral values was one of the most important factors influencing household recycling outcomes in Lithuania and Sweden. In their study in Norway, Bruvoll et al (2012) discovered that moral standards are significant in motivating people to intend to participate in recycling activities because they consider it their responsibility and personal duty.

Furthermore, Halvorsen (2008) discovered that moral standards influence Norwegians' recycling since respondents believe it is their moral role to recycle and they may feel bad if recycling is left to others. According to White et al (2009), moral norms influence individuals' intentions to engage in specific behaviors, particularly environmental behavior. Tonglet et al (2005) argue that individuals' moral standards are major predictors of people's recycling intentions and should be included in the study framework because recycling behavior is one of the environmental behaviors. Chen & Tung (2010) discovered that moral norms had a substantial influence on consumers' intentions to participate in recycling activities.

A measure's perceived policy efficacy refers to an individual's positive or negative opinion of a given policy measure. This scenario can be investigated by questioning respondents about their perceptions of the public authority's effectiveness, clarity, and adequacy (Wan et al., 2014). According to Schneider & Ingram (1990), the policy can be used to motivate people to modify their behavior. The perceived effectiveness of policy instruments is projected to have a considerable influence on household recycling intentions in this study.

This study discovered that the variable of perceived policy effectiveness did not affect household recycling intentions. This conclusion contradicted the findings of the Wan et al. investigation (2014). According to Wan et al (2014), when people have a more positive sense of policy success, they are more likely to recycle. As a result, people would have a more positive mindset and be more mindful of their behavior. This suggests that when a more effective motivational device is recognized, a higher level of intention to undertake the specific behavior is induced (Wan & Shen, 2013).

This study, however, discovered no significant relationship between perceived policy effectiveness and household recycling intentions. This is because the majority of respondents perceived the recycling policy as moderate. Despite their low view of the efficiency of the government's policies, people continue to recycle. As a result, perceived policy efficacy did not affect household recycling intentions.

### **Conclusion**

The findings of this study revealed that only three independent factors, attitudes, subjective norms, and moral norms, substantially influenced household recycling intentions, with p values of .095, .005, and .004, respectively. The regression results show that households in Flat PPR Sri Pantai used these three dimensions to develop their recycling intentions. In other words, the household considers three elements before deciding to recycle: attitude, subjective norms, and moral norms. Among these three independent variables, the beta weights show that moral norms had the greatest influence on household recycling intentions. It is followed by subjective norms and attitudes. In terms of moral norms, the majority of respondents feel a feeling of social responsibility and moral obligation to recycle. Households that believe they have a moral obligation to segregate their household waste will be encouraged to recycle.

Furthermore, they believe that people who are important to them, such as family members, neighbors, and friends, have pushed them to form recycling intentions. Furthermore, households with favorable attitudes toward recycling will be encouraged to participate in recycling activities. They assumed that by participating in recycling activities, they would be able to make money while also helping to preserve the environment. However, the regression results show that neither the variable perceived behavioral control nor the variable perceived policy efficacy had a significant relationship with household recycling intentions. These situations occurred as a result of the fact that the household at Flat PPR Sri Pantai, Pantai Dalam continues to recycle (despite some difficulties, such as a lack of recycling facilities such as recycle bins) because recycling is one of their activities to earn money to finance their daily lives. This study implies that it is critical to foster an environmentally friendly culture within one's community and that environmental campaigns and education should begin at the local level. Policies and initiatives aimed at increasing environmental awareness could foster a favorable attitude toward the environment, which, when combined with the capacities and resources available, could considerably impact the adoption of recycling behavior among residents of Flat P.P.R Sri Pantai.

This study contributes both theoretically and practically. According to the Theory of Planned Behavior, attitudes, subjective norms, and perceived behavioral control can all influence people's intentions to undertake specific behaviors. The empirical results of this study reveal that the attitudes and subjective norms strongly influenced recycling intentions. A household with a positive attitude about recycling is more likely to recycle. This is because households believe that recycling will benefit them as well as others. Furthermore, they believe that societal pressure influenced their recycling intentions (subjective norms). In other words, those who are essential to them, such as family members, neighbors, and coworkers, will influence them to recycle.

However, the empirical findings revealed that perceived behavioral control had little effect on recycling intentions. It demonstrates how the study's finding (perceived behavior control) contradicts several of Ajzen's views. Furthermore, this study adds to the current knowledge by using low-income housing tenants as a sample to fill a gap in earlier studies. This should spur more research on recycling intentions in other areas. It is also suggested that a bigger sample size be used to create more generalizable results. Examining and comprehending the elements that influence household recycling intentions, as well as comprehending public perception of policy efficacy, can assist the government in developing comprehensive recycling policies and programs. This research will assist the government, particularly Kuala Lumpur City Hall (DBKL), in developing a sound recycling program for the residents of Flat PPR Sri Pantai.

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