

# Study of Household Waste Management and Recycling Awareness Between Residential Areas in Kuala Nerang, Kedah, Malaysia

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**ABSTRACT:** This paper presents a study on household waste management and recycling awareness. Residential areas are the major sources of solid waste as that is where people live. The waste that is usually disposed of from residential areas includes food waste, plastic waste, paper, glass, tin, and others. The increasing trend in waste generated from homes has become a major concern. This study aimed to assess household waste management and recycling awareness in two residential areas located in Padang Terap District, Kuala Nerang, Kedah, Malaysia. Recently, Padang Terap district showed an increase in waste generated compared to another district, Kedah. An open-ended questionnaire was distributed to approximately 32 respondents, and an interview was conducted to study household waste management and recycling awareness in two residential areas—Taman Jati and Taman Pelangi. The research shows that household waste management to segregate the waste remains a problem, despite most respondents being aware of this issue through different media. Furthermore, the lack of household waste management and recycling programs and facilities by the local authorities caused residents to be reluctant to practice these activities.

**KEYWORDS:** Household; waste management; segregation of solid waste; recycling awareness

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## 1. Introduction

Malaysian had generated 38,142 tons of waste per day in 2018, an increase from 19,000 tons of waste per day in 2005. From the growth of the population and the commercial waste in the 2018 survey, the amount of waste generated has increased significantly from 2005 to 2018. The waste collected was food waste (44.5%), followed by plastic waste (13.2%) and diapers (12.1%) for municipal solid waste only and did not include construction and industrial waste [1]. However, with the latest statistics, the composition of waste was changing when plastic waste made up to 20% of waste. Residential areas are the major sources of solid waste as that is the place where people live. The waste that is usually being disposed of from residential areas includes food waste, plastic waste, paper, glass, cardboard and household items such as

used oil, electronic waste, and tires. The increasing trend in waste generated from homes has become a major concern. Tons of municipal solid waste, including recyclable items that come from residential areas and industrial areas, is dumped at many landfill sites. The landfills in Malaysia cater to about 95% of the waste disposal, including recyclable waste, and compostable waste and 85% of landfills have reached their full capacity and are expected to close in a few years [2-4]. Therefore, good waste management needs to be practiced in every household to reduce solid waste generation. Solid waste management can be defined as the process of collecting, treating, and disposing of solid waste. The complexity involved in the collection, separation, recycling, and final disposal of solid waste has become a major problem for solid waste management for many years [5]. This study aimed to assess household waste management and recycling awareness in two residential areas located in Padang Terap District, Kuala Nerang, Kedah, Malaysia.

## **2. Materials and Methods**

The methodology in this study involved several tasks such as observation, design of the survey questionnaires, data collection, processing of data from the survey, analyzing and evaluating the results. A properly planned research methodology is very important to get accurate data and finish the task on time.

### *2.1. Survey Research*

Survey research can be described as gathering information from respondents through their answers and obtaining individuals of interest in a quick way. The survey can be divided into two forms, which are cross-section surveys that are carried out at a particular time only to describe the behavior or attitude of people and longitudinal surveys that are carried out within a stipulated time [6].

### *2.2. Questionnaire*

The questionnaire can be defined as a list of printed questions for the respondent to answer the question based on his opinion by writing out the answers or choosing the provided answer to gather information and data for the research [7]. For this study, a closed-ended question has been used. A closed-ended questionnaire does not give respondents adequate answers to choose from because the data is categorized as nominal data and the generated qualitative data will be converted to quantitative data by counting yes or no from the respondents.

### *2.3. Interview*

An interview can be conducted via phone, computer, or face-to-face interview. The interview is more time-intensive and more expensive compared to other methods, but it can collect more complex information and is not suitable for large samples [8].

## **3. Results and Discussion**

The results of the study were based on the objectives of the study. The questionnaire is divided into three sections. The first section is about demographic information including gender, age, educational level, occupation, and number of people in the household. The second section is about the awareness of household waste management, and the third section is about recycling

awareness. The results of the questionnaire were compared between the two residential areas, which are Taman Jati and Taman Pelangi.

### 3.1. Demographic Information

The demographic background of the respondent and household characteristics of households are summarised in Table 1 and Table 2.

**Table 1:** Demographic information of respondent (Taman Jati).

<b>Demographic Information (n=16)</b>	<b>Percentage (%)</b>
<b>Gender</b>	
Male	43.8
Female	56.3
<b>Age</b>	
15-24	50
25-34	25
35-44	25
45-55	0
>55	0
<b>Educational Level</b>	
Illiterate	0
Primary school	0
Secondary school	31.3
University graduate	68.8
<b>Occupation</b>	
Unemployed	0
Student	50
Government employee	12.5
Private employee	25
Own business	12.5
Street vendor/own small business	0
<b>Number of Persons in Household</b>	
1-2	0
3-4	40
5-6	60
>7	0

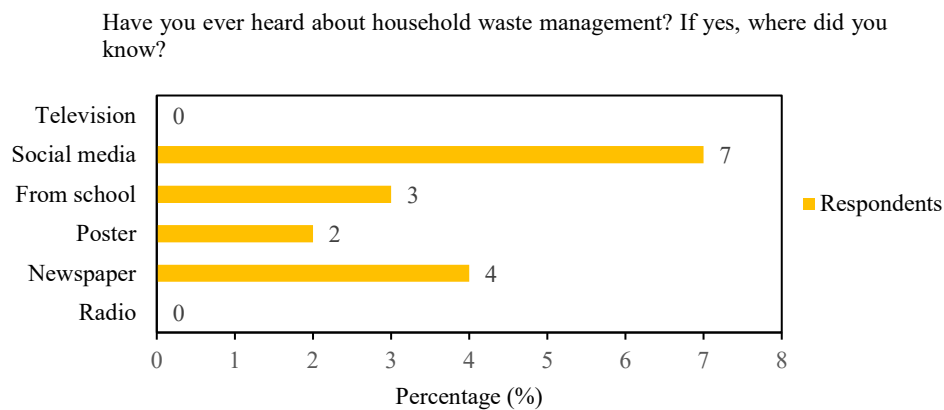
**Table 2:** Demographic information of respondent (Taman Pelangi).

<b>Demographic Information (n=16)</b>	<b>Percentage (%)</b>
<b>Gender</b>	
Male	47.5
Female	62.5
<b>Age</b>	
15-24	37.5
25-34	25
35-44	31.3
45-55	6.3
>55	0
<b>Educational Level</b>	
Illiterate	0
Primary school	0
Secondary school	31.3
University graduate	68.8
<b>Occupation</b>	
Unemployed	0
Student	37.5
Government employee	25
Private employee	18.8
Own business	18.8
Street vendor/own small business	0
<b>Number of Persons in Household</b>	
1-2	0
3-4	43.8
5-6	50
>7	6.3

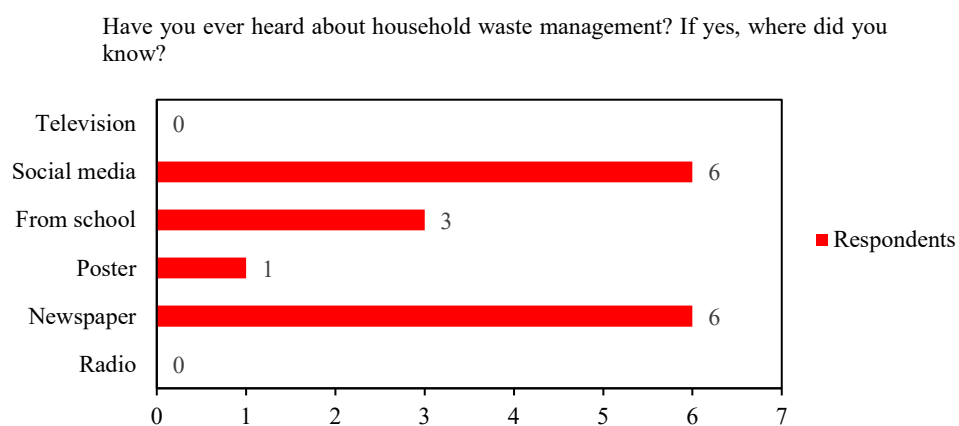
The demographic information collected in this study includes gender, age, educational level, occupation, and number of people in the household from 16 respondents each from Taman Jati and Taman Pelangi. According to Tables 1 and 2, the proportion of female respondents is slightly higher than that of male respondents. Apart from that, the number of respondents from age 15 to 24 is the highest to answer this questionnaire. From that, we may conclude that the majority of the students answering this questionnaire are students, where we can see that 50% of the students are in Table 1 and 37.5% from Table 2.

### 3.2. Awareness of Household Waste Management

This study aimed to observe the awareness of the residents at Taman Jati and Taman Pelangi regarding household waste management. Based on Figure 1 and Figure 2, it can be concluded that everyone has managed to learn about household waste management through radio, newspapers, posters, education from school, social media, or television.



**Figure 1.** Percentage distribution on awareness of household waste management through any medium (Taman Jati).



**Figure 2.** Percentage distribution of awareness of household waste management through any medium (Taman Pelangi).

Based on the observation in Table 3 and Table 4, there were 56.3% of the residents fully practicing segregation of household waste in Taman Jati, whereas only 37.5% practice

segregation of household waste in Taman Pelangi. The awareness of solid waste management is intermediately well known by the citizens [9,10].

**Table 3.** Response rate (%) of awareness on household waste management (Taman Jati).

Question	Priority Weight (%)	
	Yes	No
Have you ever been educated on proper waste disposal from the local authority?	75	25
Do you segregate the household waste generated at your home?	56.3	43.8
In your opinion, do you find household waste segregation hard to be practised?	50	50
Do you think waste segregation can be practised in your residence?	87.5	12.5
Do you aware that segregation of household waste can reduce waste generated in landfill?	62.5	37.5

**Table 4.** Response rate (%) of awareness on household waste management (Taman Pelangi).

Question	Priority Weight (%)	
	Yes	No
Have you ever been educated on proper waste disposal from the local authority?	50	50
Do you segregate the household waste generated at your home?	37.5	62.5
In your opinion, do you find household waste segregation hard to be practised?	75	25
Do you think waste segregation can be practised in your residence?	31.3	68.8
Do you aware that segregation of household waste can reduce waste generated in landfills?	68.8	31.3

### 3.3. Recycling Awareness

Based on Table 5 and Table 6, respondents of this study showed an understanding of the importance of recycling in both Taman Jati and Taman Pelangi. However, the respondents' rate for fully recycling in Taman Pelangi is very low with only 37.5% compared to Taman Jati with 68.8%. The big difference in recycling practices in both residential areas might be because of the presence of the recycle bin. There were recycle bins at Taman Jati, whereas there are no recycle bins located at Taman Pelangi. This issue might be one of the hindrances for residents at Taman Pelangi to recycle their recyclable waste similar to [11,12].

**Table 5.** Response rate (%) on recycling awareness (Taman Jati).

Question	Priority Weight (%)	
	Yes	No
Are you aware of the importance of recycling?	86.7	13.3
Have you ever heard of the 3R concept?	93.8	6.3
Do you recycle?	68.8	31.3
Does your residence offer recycle bin?	100	0
Would you segregate your household waste and recycle if you are told by a local authority or collection service company?	100	0

**Table 6.** Response rate (%) on recycling awareness (Taman Pelangi).

Question	Priority Weight (%)	
	Yes	No
Are you aware of the importance of recycling?	75	25
Have you ever heard of the 3R concept?	100	0
Do you recycle?	37.5	62.5
Does your residence offer recycle bin?	0	100
Would you segregate your household waste and recycle if you are told by a local authority or collection service company?	81.3	18.8

## 4. Conclusions

Based on the results above, there is still a lack of household waste management to segregate the waste even though most of the respondents are aware of household waste management

through many mediums such as newspapers, social media, posters, and school. Apart from that, almost every respondent is aware of the importance of recycling for both residential areas. However, the respondents from Taman Jati are more likely to participate in recycling activities compared to Taman Pelangi. This is because there is no recycling bin provided at Taman Pelangi and other recycling centres or recycling bins are further than their residential areas. Referring to the interview with the local authority, the lack of programmes to promote household waste management and recycling activity by the local authority may be one of the reasons why the residents do not properly practice proper household waste management and recycling. Therefore, to move forward to more sustainable household waste management, everyone needs to give their commitment, including the citizens, local authorities, and collection service companies. Thus, to achieve sustainable household waste management, everyone needs to start by segregating their solid waste, reducing waste generated, reusing recyclable items, recycling recyclable items, and composting the organic waste in each household.

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### Competing Interest

The authors declare no conflict of interest.

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