Recycling Perception And Practice In Shah Alam Municipality

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***Abstract*— Fast growth in the populace, development and technology has caused the increasing sum of municipal solid waste in Malaysia. To overwhelm this issues, recycling is one of the effective ways. This research objectives are to evaluate the public perception and to analyse practices of recycling in the city of Shah Alam. By 2030, Shah Alam city council aims to achieve 'Zero Waste'. Thus, with this view, a preliminary investigation is required to be done, which is the main focus of this research. A questionnaire was developed to determine perception and practice of recycling. The survey were being distributed manually and by spreading the link from google.docs to the Shah Alam's residents. The data collected was analyzed using statistical analysis, minitab software. The result showed that, majority of the Shah Alam's resident aware and believe that recycling is important. However, low participation of respondent's on recycling practice despite the fact that high percentage of respondent is knowledgeable on how to recycle solid waste. In Shah Alam municipality, majority of respondents participate in recycling practice due to environmental concern, followed by convenient and economic incentives. Result of the survey showed that lack of awareness about the recycling program and very few educational program about recycling are two mains barriers to sustainable recycling in Shah Alam. This research study found that, more convenient location for bins is the most potential strategy to promote recycling activity. In conclusion, more public participation and awareness need to be held to in order to increase the recycling practice in Shah Alam.**

Keywords—recycling, solid waste, Shah Alam

I. INTRODUCTION

In Malaysia, it is reported that 23,000 tons of waste is produced daily with Kuala Lumpur as the capital of the country produced 3,000 tons a day. Forecasts predict that this generation of waste will up further in the coming years and unfortunately, it was recorded that less than 5% of the waste generated is being recycle [1]. According to waste management hierarchy, waste minimization or source reduction is the most preferable in order to lessen the impact of solid waste generation. This is then followed by what is generally termed as Reduce, Reuse and Recycle, and Recovery (4R). Recycling comprises the techniques of splitting, accumulating, and recovering or reused unwanted items into different product [2] .

In many parts of the world, recycling is a general practice, and happens at a multiplicity of stage, from informal systems to authorities. Despite the statistic that the higher rates of the municipal solid waste generated in Malaysia are recyclables, which incorporates paper, plastics among others representing about 60% of the aggregate waste volume, only around 5-5.5% recycling rate was reported have been accomplished. Though past research indicate that over 70% folk know and conscious about the recycling idea however not more than 25% really practice recycling in daily life. Our country has been far left behind compared to others developed countries in Asia which Korea has achieved waste recycling rates of 44 - 50% between 2002 to 2008 and Singapore from 44% in 2002 to 48% in 2004 and expected to reach 60% in 2012 [3].

The Klang Valley is the most developed district with 45 per cent of Malaysian urban centres being positioned here. The city of Shah Alam is one of the major centres in the Klang Valley and is a developing new town. Solid waste management is one of the issues in the city of Shah Alam and initiative plans are necessary which target the participation of entire populations to achieve a sustainable environment. In Shah Alam, the problems and encounters of solid waste controlling are the improved speed of development and growth that prompts expanded waste generation, the economic and money limitation confronted by city council, the deficiency of practical expertise for exceptional waste controlling, an absence of community consciousness and involvement, unlawful dumping and higher amount of the complexity of waste composition [4].

Solid waste that had been disposed in the landfill can cause long-term negative impacts towards the environment because the landfill area are exposed dumping sites. By 2020, if our country continues to rely on landfills, it might raise greenhouse gas emissions (GHG) up to 50% as revealed by The National Solid Waste Management Department [5]. Not only that, dumping the solid waste in landfills also can be unsafe and threat to world and can decrease soil richness [6]. Recycling can helps produce less garbage and aid in minimizing environmental effect [7]. Recycling also as a sustainable waste management strategy that can yield huge economic benefit [8].

Many variables identified as stimulation to the recycling practice in various areas for example, community involvement, demographic background, individual motivation and enforcement of a regulatory structure, environmental concerns, economic incentives and others. Among of those factors, community involvement is most important variables in order to produce an effective reusing platform [9]. In 2020, government aim is to achieve solid waste recycling rate up to 22% [10] and Shah Alam

City Council objective is to achieve 'Zero Wasste City' in 2030 [4]. Thus, with this view, a preliminary investigation is required to be done, which is the main focus of this research.

II. METHODOLOGY

The process in conducting the survey is represented in figure 1 below.

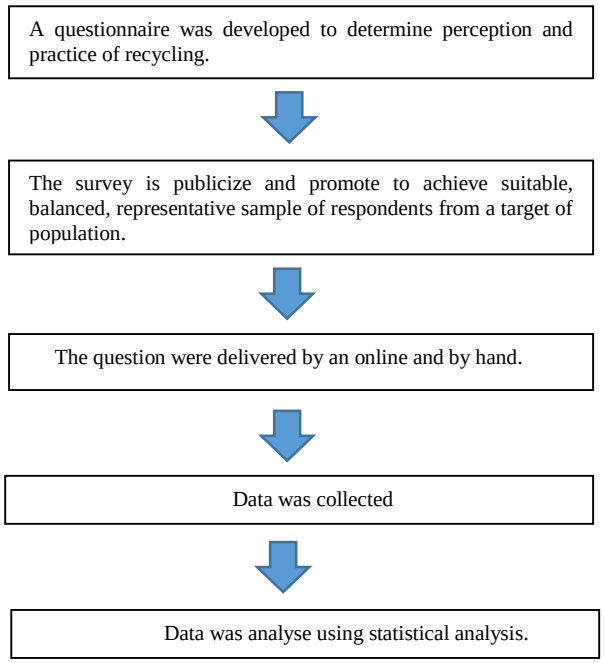

Fig 1: Process of delivering the survey [11]

In order to evaluate Shah Alam's recycling perceptions and practice, a questionnaire was created and delivered at different randomly selected sections in Shah Alam started on December 2017 until April 2018. Altogether, the research study involved 480 number of respondents. Number of respondents were considered to represent the voice of population. There are three main sections of the questions in the survey that applied as an investigative study strategy to attain a better conceptual of the recycling perception and practice in Shah Alam municipality. The first section is to obtain the demographic background of the respondents involved, such as age, gender, monthly salary, education level and occupation. This data was take to observe if these aspect had any relative to recycling involvement and commitment. The second part included survey to recognize the awareness and perception of the Shah Alam community on recycling practices. The type of question asked in the second part of the questions consists of dichotomous questions that simply asked the respondent to answer in a yes or no in the questions. The third section of the survey comprised questions to figure out the influence that affected community recycling behaviour and practice. The questions in the third section are being constructed in order to determine the potential of recycling practices in Shah Alam, the inspiration for recycling, the standing of recycling to them, the obstacles that leads to community not being able to recycle and to propose strategies on how to increase recycling practices in the city. Most of the questions asked consist of multiple choice question and dichotomous questions. The questionnaire survey is conducted in dual language which are Bahasa Melayu and English to meet the participant's language requirement. To complete the study, there are two methods being used. First, a questionnaire was being distributed manually among Shah Alam's residents and another method is survey was spreading by the link from google.docs to the Shah Alam's resident. For the first method, the questionnaire was be collected directly when finished. For the second method, the result from the Google form obtained from the respondents is automatically presented in the spreadsheet in Google Docs. The spreadsheet gadget in the Google Docs can be used to export the result to the Microsoft Office Excel. The data collected is then analyzed using statistical analysis, minitab software.

III. RESULTS AND DISCUSSION

A. Demographic Background

Table 1 below shows demographic data of respondents involved in this research study.

Table 1: Demographic data

Demographic data	Number of respondent, (%)
Age	
Under 20	6.5%
21- 29	36.8%
30 - 39	27.0%
40 - 49	19.5%
50-59	10.2%
Gender	
Male	45%
Female	55%
Education level	
University level	42.8%
Secondary school	36.7%
Primary school	11.3%
Did not attend any school	9.2%

Occupation	
Government	16.7%
Private	19.9%
Own business	16.5%
Housewife	5.5%
Student	35.5%
Unemployed	5.9%
Income	
Less than RM 1000	30.4%
RM 1000 – RM 2000	11.7%
RM 2000 – RM 3000	16.9%
RM 3000 – RM 4000	24.3%
More than RM 4000	16.7%

The first section of the survey were asked about demographic background of the respondent which comprise five question which are age, gender, education level, monthly salary and occupation. This data is important to observe if these aspect had any relative to recycling involvement. In this research study, there are 480 respondents involved which are 55% of them are female. The age of the respondents involved varies starting from under 20 years old until 59 years old. Most of the respondents are aged from 21-29 years old which is compromise 36.8%, followed by respondents from aged 30-39 years old and 40-49 years old which are 27.0% and 19.5% respectively. The least respondents are comes from group of age under 20 years old and 50-59 years old which only contribute 6.5% and 10.2% each. Education background is essential in order to see either level of education had positive outcomes on recycling practices. In this survey, 42.8% of respondents involves are from university level background, 36.7% of them with secondary school level background, 11.3% comes from primary school level of education while 9.2% of respondents did not attend any school. Based on the result, majority of the respondents which compromise 90.8% at least had attend the school. This indicates that respondent of this research were literate and were able to understand and apply recycling practice. Occupation of respondents also were investigated to spot either factors of busy working affect the recycling practice. The result from research study displays that 53.1% number of respondents are working either with government, private and doing business while another 46.9% number of respondents were housewives, students and unemployed. The last part of the demographic background is to seek amount of income respondents. Income was investigated to study either economic background effect recycling practice in Shah Alam municipality.

B. Perception of the Shah Alam community on recycling practice

Figure 2 demonstrate percentage of awareness on solid waste in Shah Alam municipality.

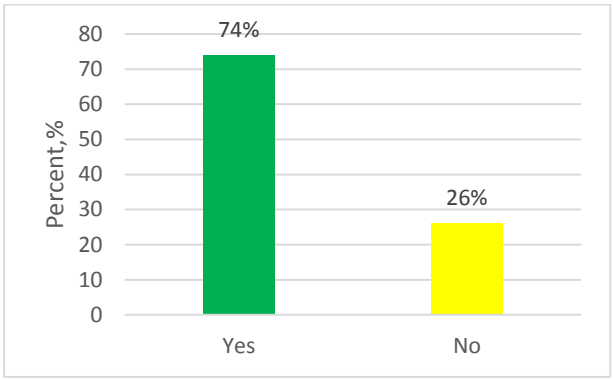

Fig. 2: Awareness about solid waste recycling in Shah Alam municipality

Based on figure 2, research find out that majority of the respondents which are 74% of respondents are aware while 26% does not aware about solid waste recycling in Shah Alam municipality. A Chi Square Test was check between gender and awareness about solid waste recycling in Shah Alam municipality and the result showed P-value is less than significance level ($p<0.05$). From the test, it can be prove that there is relationship between gender and awareness on solid waste recycling. In Shah Alam municipality, female are more aware about solid waste recycling compared to male. This research finding is similar with research study by (Nurliyana, 2016) that was conducted at households from the community in Selangor. The result also showed that female are more aware about solid waste recycling [12].

Figure 3 below shows result of knowledge level on how to recycle solid in Shah Alam municipality.

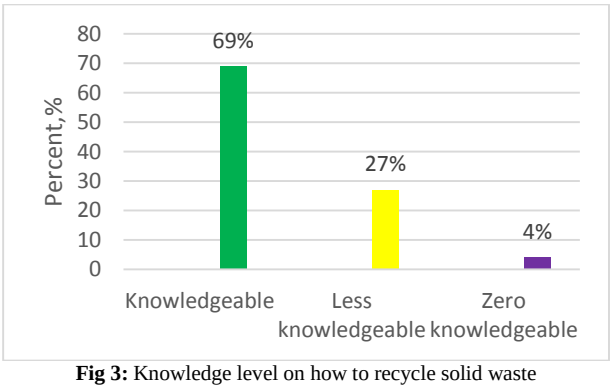

Fig 3: Knowledge level on how to recycle solid waste

Based on data above, on the knowledge level of the community, high percentage where 69% of respondents are knowledgeable on how to recycle solid waste. The remaining 27% of respondents have less knowledge while a small percentage of 4% of respondents have zero knowledge. Most respondents with less knowledge and zero

knowledge also answered that they are not aware about recycling campaign in Shah Alam municipality. Based on statistical analysis conducted by minitab software, there is no relationship between level of education with knowledge level on how to recycle solid waste since the ($p>0.05$). However, analysis shows there is relationship between gender and knowledge level on how to recycle solid waste. It is proven that female are more likely to have knowledge on recycle compared to male. This is might because, female are more exposed in doing household activity including handle the waste. The research study that was conducted in Lagos, Nigeria also found that female are more knowledgeable on how to recycle solid waste compared to male. According to (Tunmise,2014), female are more environmental friendly and concern about environment problems [13].

Figure 4 below displays the result for respondent's perception of importance of recycling.

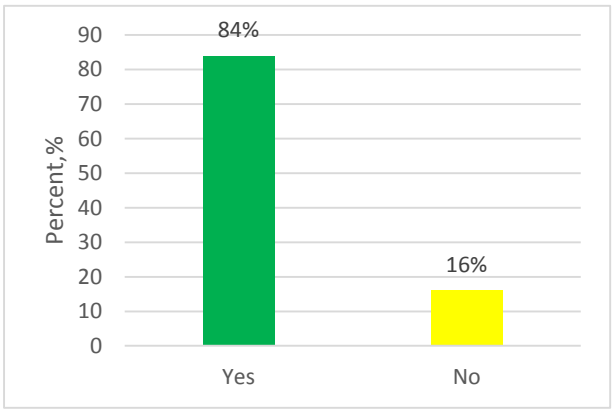

Fig.4: Respondent's perception of importance of recycling

In order to determine an individual's behaviour, it is necessary to understand their beliefs, intentions, and the importance of recycling. The question were asked about respondent's perception about recycling practice. Based on figure 4, a high percentage which is 84% of respondents agreed that recycling is important. Thus, the evidence suggests that most respondents in Shah Alam do care about recycling and are motivated to be engaged in recycling practice. Relationship between respondent's perception of importance of recycling and respondent's level of education was analysed using Chi Square Test and the result showed that level of education has effect on respondent's perception of importance of recycling practice in Shah Alam municipality since the P-value obtain less than significance level ($p<0.05$). Respondents who have education tends to believe that recycling is important. Age also influence respondent's perception of importance of recycling since ($p<0.05$). Most of respondents who believe recycling is not important comes from group age of 50-59 years old. This happens might because the elder did not know the recycling benefit and they do not expose to the recycling practice.

C. Practice of recycling in Shah Alam municipality

The third section of the survey comprised questions to figure out the attitude of Shah Alam's residents towards recycling and influence that affected community recycling behaviour and practice. Attitude stimuli entity's choice of action and reactions to challenges and motivations to recycle. Attitude toward things can be evaluated based on three parameters which are positive, negative and neutral. People behaviour, policy or choices is depending directly on attitude. There are many elements that effect individual recycling behaviour, however the most highlighted are motivations for recycling and of satisfaction while practicing recycling [14]. The questions in the third section are being constructed in order to determine the potential of recycling practices in Shah Alam, the inspiration for recycling, the standing of recycling to them, the obstacles that leads to community not being able to recycle and to propose strategies on how to increase recycling practices in the city.

Figure 5 demonstrate result for percentage of respondents that involved in recycling practice.

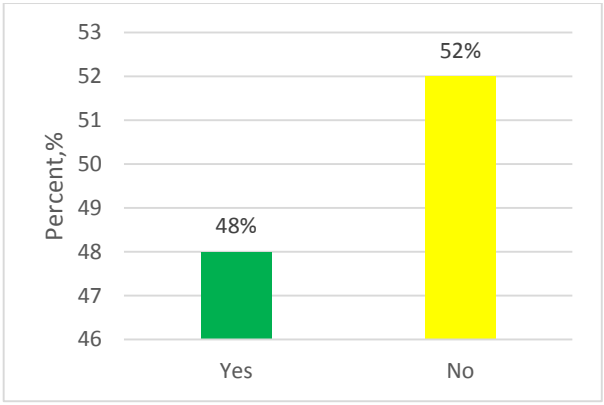

Fig 5: Respondent's involvement on recycling practice

The first question of third section were asked about involvement of respondents on recycling practice. The result above displays that low percentage which is only 48% respondent were show positive participation on recycling practice despite the fact that 69% of respondent is knowledgeable on how to recycle solid waste. This research result has similar data from the survey done by Asmawati Desa in Universiti Kebangsaan Malaysia (UKM) Bangi in year of 2011 which is higher percentage on how to recycle solid waste but low percentage of participation on recycling practices. The study in UKM demonstrate that 63.8% number of the students have understanding about what is solid waste management system. However, the result of the survey presented that 65.9% number of students did not practice proper solid waste management in daily life [1].

Based on statistical analysis conducted by minitab software, there is relationship between gender with respondent's involvement on recycling practice ($p<0.05$). From the analysis, it showed that most of 48% of respondents that show positive respond on recycling practice are female.

Figure 6 below shows result of respondent's motivations for recycling practice.

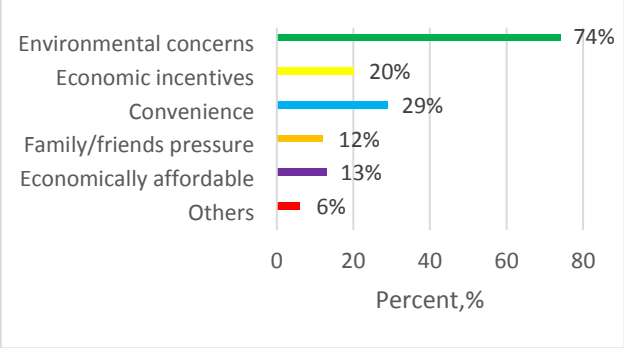

Fig. 6: Respondent's motivations for recycling

To increase recycling practice, motivations for recycling needs to be identify first. This question give several options of answer that stimulate to recycling practice such are environmental concerns, economic incentives, convenience, family or friends pressure, economically affordable and others. Based on figure above, it can be analyse that most respondents which is 74% with opinion that environmental concern is their reason to participate in recycling practice. According to (Zurbrugg 2003), daily doings produce waste and these waste that is not properly controlled, kept, disposed can caused environmental problems and disturb community health [15]. Unmanaged municipal waste can effect environment such as can caused landfill gas emission which yield substantial quantity of CH_4 into the atmosphere [16]. Based on the result, it showed that Shah Alam municipality concern about environment issues in the city. The result proved that statement from other researcher which stated that environmental concerns and motivations for recycling has strong relationship. These data also similar with research done in 2011 by Custom Research North America (CRN) where high percentage which is 75% of respondents stated that environmental concerns as their main factor to participate in recycling [14]. Second options preferable factor that stimulate them to recycle which is 29% is because it is convenient. 20% of respondents participate in recycling due to economic incentives offered and 13% because of it is economically affordable. Family and friend pressure which contribute 12% also become one of the factors respondents in Shah Alam to engage in recycling practice. While research conduct in 2011 by Custom Research North recorded that 26% of the respondents participate in recycling due to influenced by family members, friends, and neighbours [14].

Barriers to sustainable recycling result in Shah Alam municipality is shown in figure 7.

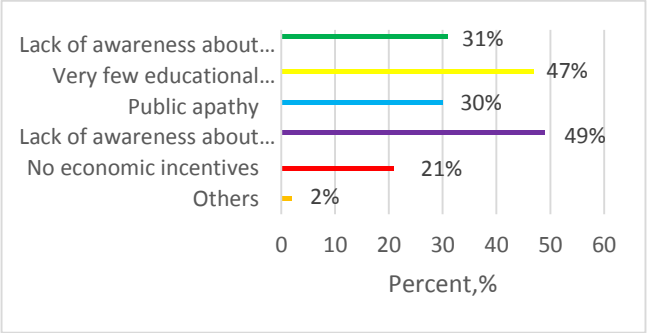

Fig. 7: Barriers to sustainable recycling

There are several potential elements had been identified and were short listed in the survey as factors of barriers to sustainable recycling which are lack of awareness about environment benefits, very few educational program, public apathy, lack of awareness about the program, no economic incentives and others. Based on figure 7, result of the survey showed that lack of awareness about the recycling program becomes main factor which compromise highest percentage, 49%. This result differ from survey conducted in the city of Laramie in Wyoming, U.S.A which recorded that highest percentage which is 44.5% voiced that public apathy as core reason of barriers to sustainable recycling [14]. In Shah Alam municipality, public apathy falls to fourth factors of barriers to sustainable recycling which is collected 30% of number of respondents. A second important challenges which is 47% of respondents agree that very few educational program conducted becomes factors of barriers to sustainable recycling followed by 31% of respondents said that lack of awareness about environmental benefit. In the city of Laramie in Wyoming, U.S.A recorded that second important factor that becomes barriers to recycle is absence of economic incentives [14] , however this element laid down on the second lowest ranking of factors of barrier to recycle in Shah Alam municipality which only 21%. Survey research was conducted by Zainura Zainon Noor (2016) in Johor Bahru had found that barriers to sustainable recycling were due to individual's negative perception and lack of facility [8]. Result of the survey recorded that 65.6% respondents think recycling were unhygienic and dirty, 53.7% deliberate that involvement in recycling were waste time and troublesome and 44.5% with reason of lack of drop-off and buy-back centres close to their location [8]. It is noticed that result of the survey in Johor Bahru have similar finding by Gamba and Oskamp (1994). In their study, they found that cleanness factor, lack of drop-off centres and lack of storage space becomes barriers to sustainable recycling [17]. Not only that, based on research done by Omran and Gebril (2011), inconvenience and lack of facilities were key challenges in recycling practic [18].

Figure 8 below demonstrate result for potential strategies to encourage recycling practices.

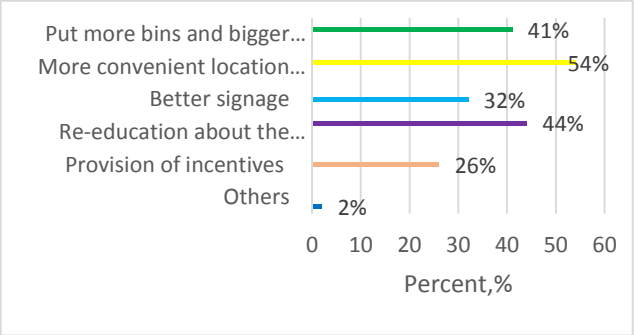

Fig. 8: Potential strategies to encourage recycling practices

Several potential strategies to encourage recycling practices has been identified and placed as multiple answer questions in the questionnaire. Put more bins and bigger one, more convenient location for bins, better signage, re-education about the recycling initiative and provision of incentives are key potential strategies to encourage recycling practices. Based on figure 8 above, this research study found that, more convenient location for bins is the most potential strategy to promote recycling activities which have highest percentage, 54%. Another potential plans to inspire recycling activity are re-education about the recycling initiative, 44%, followed by put more bins and bigger one, 41%. Not least important is 32% of respondents agreed that better signage was one of the potential technique to stimulate recycling practices. While research study conducted by Zainura Zainon Noor (2016) in Johor Bahru highlighted that the most potential strategies to encourage recycling activity was better signage,67.1%[8]. According to Schoot (2011), the most effective technique to promote involvement of community were by providing sufficient information [19]. 26% of respondents stated that provision of incentives can helps to promote recycling. These result are consistent with those in a research by (Holmes, 2014) in which they found financial incentives were one of the useful technique to encourage recycling practice. In August 2014, secretary of State for Communities and Local Government of United Kingdom had provided a $5 million fund to support local authorities to give incentive to public that practice recycling [20].

Figure 9 shows level of satisfaction with the frequency of recyclable collection service in Shah Alam municipality.

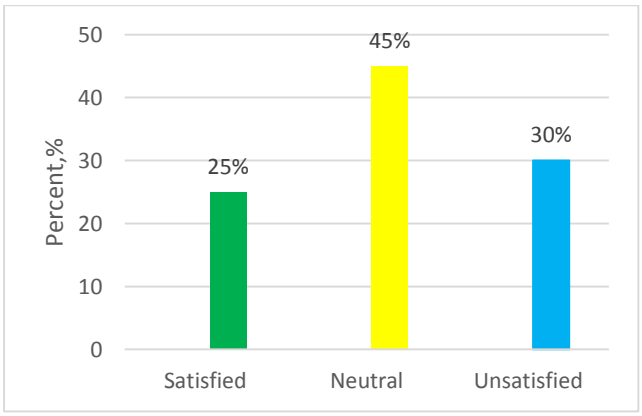

Fig. 9: Level of satisfaction with the frequency of recyclable collection services

In Shah Alam, Alam Flora Sdn Bhd is responsible towards solid waste management that accountable for collecting, cleaning and disposing waste. Alam Flora Sdn Bhd is scheduled to collect domestic, non-hazardous, and recyclable waste twice a week [4]. Collection is conduct in front of resident house and door to door method [11]. Based on figure 9, results of the analysis of the level of satisfaction with the frequency of recyclable collection service showed that 25% of number of respondent were satisfied, 45% was being neutral and 30% were unsatisfied with the recyclable collection services. This result is quite similar with study done in the City of Laramie in Wyoming, U.S.A which recorded that high percentage of respondents showing their neutrality on level of satisfaction with the frequency of recyclable collection service [14].

IV. Conclusion

Overall, the result of the survey shows that high awareness on recycling practice among Shah Alam's community and most of residents are knowledgeable on how to recycle solid waste. A high percentage of respondents believe recycling is important and it proved that Shah Alam's residents do care about recycling and are motivated to be engaged in recycling practice. However, the result shows low respondent's involvement on recycling practice. Thus, with this view, Shah Alam City Council should re-educated community about recycling initiative to increase recycling practice. In conclusion, the objective of the experiment to evaluate the public perception and to analyse practices of recycling in the city of Shah Alam were achieved.

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