
**UNIVERSITI PUTRA MALAYSIA**

# *KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS RECYCLING ACTIVITY AMONG SECONDARY SCHOOL STUDENTS IN HULU LANGAT, SELANGOR*

**NUR ATIQAH BINTI YAZIZ**

# KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS RECYCLING ACTIVITY AMONG SECONDARY SCHOOL STUDENTS IN HULU LANGAT, SELANGOR

**BY**

**NUR ATIQAH BINTI YAZIZ**

**Thesis submitted in fulfilment of the requirement for the degree of Bachelor Science (Environmental and Occupational Health) from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.**

## ACKNOWLEDGEMENTS

Foremost, I would like to express my sincere gratitude to my project supervisor, Prof Madya Dr Haliza Abdul Rahman on her support, guidance and advices in my project. I am grateful and lucky being able to learn her insights that had helped me to complete my work on time.

I also like to thank Dr Ho Yu Bin as the coordinator for my final year project. Her invaluable guidance and comments also had helped me to successfully complete my project. Apart from that, I would like to express my sincere thanks to all lecturers and staff of the Department of Environmental and Occupational Health who had contributed directly or indirectly in making this study successfully.

Finally, I would like to thank to Principle of two schools who helped me in completing my data collection. I submit my utmost gratitude to the secondary school student at Kajang and Semenyih who participated in the survey and had therefore made this study possible and successful. I would also like to thank my family and friends for their invaluable encouragement and endless moral support throughout this project.

## ABSTRACT

### KNOWLEDGE, ATTITUDE AND PRACTICE OF RECYCLING ACTIVITY AMONG SECONDARY SCHOOL STUDENTS IN HULU LANGAT

### NUR ATIQAH BINTI YAZIZ

**Introduction**: Solid waste generation is one of the major environmental problems faced by municipalities in the world. Thus, proper solid waste management such as recycling is necessary in preventing further environment destruction. In Malaysia, the country is producing more than 15000 tonnes per day of waste and by the year 2020, it will reach 30000 tonnes per day. Although awareness and concern about the problem of waste are constantly increasing, participation in recycling programme is still rather low especially among teenagers. Therefore responsibility is placed on the government hand to implement effective programme that considers the needs of individual and the environment which can adopt environmentally friendly behaviour and if individual perceive that recycling is an important issue, perhaps because of their knowledge, they will surely invest their time and effort in recycling programme. **Objective**: To study the knowledge, attitude and practice toward recycling activity among secondary school students in Hulu Langat. **Methodology**: A total of 500 respondents who fulfilled the inclusive criteria were selected in different location of school of Hulu Langat based on rural and urban area. Students who were form six students and unable to read and write were exclude from the study. Questionnaires were administered to determine the knowledge, attitude and practice on recycling activity and their social demographic information. **Results and Discussion**: Both groups showed dominance on moderate level for independent variable. Level of knowledge for urban and rural schools was moderate which was 185 (74.0%) and 201 (80.4). Level of attitude for urban and rural schools was also showed moderate which was 195 (78%) and 193 (77.2%). Meanwhile, for practice level both schools showed bad practice on recycling which was 176 (70.4%) for urban school and 190 (76.0%) for rural school. There was difference in mean of knowledge and practice score between urban and rural schools ($p<0.05$, $p= 0.018$ and $p= 0.012$). However, there was no difference in mean of attitude between urban and rural schools ($p>0.05$, $p= 0.581$). There was an association between age with attitude and practice level ($p<0.05$, $p= 0.018$, $p= 0.00$). Knowledge level and practice level showed and association which students with low knowledge tend to have poor practice on recycling activity ($p<0.001$, $p= 0.00$). There was an association between attitude and practice of recycling ($p<0.01$, $p= 0.00$). Students with moderate attitude tend to have poor practice on recycling activity. **Conclusion**: Secondary school from both locations had moderate knowledge, attitude and poor practice on recycling activity. Urban and rural school students had difference in term of knowledge and practice towards recycling activities due to urban schools had already been exposed to variety technique of waste management.



**Keywords**: Knowledge, Attitude, Practice, Hulu Langat, Secondary School Students

## ABSTRAK

# MENGKAJI TAHAP PENGETAHUAN, SIKAP DAN AMALAN TERHADAP KITAR SEMULA DI KALANGAN PELAJAR SEKOLAH MENENGAH DI HULU LANGAT

**NUR ATIQAH BINTI YAZIZ**

**Pengenalan**: Sisa pepejal adalah salah satu masalah alam sekitar utama yang dihadapi oleh majlis perbandaran dunia termasuk di Malaysia. Oleh itu, pengurusan sisa pepejal yang betul seperti kitar semula adalah perlu bagi mencegah kemusnahan alam sekitar. Di Malaysia, penghasilan sampah lebih daripada 15000 tan setiap hari dan pada tahun 2020, ia akan mencapai 30.000 tan sehari. Walaupun kesedaran dan kebimbangan mengenai masalah sisa sentiasa meningkat, penyertaan dalam kitar semula masih rendah terutama di kalangan remaja. Oleh itu, pihak berwajib perlu melaksanakan program yang berkesan dimana mengambil kira keperluan individu dan alam sekitar bagi memupuk tingkah laku yang mesra alam dan jika individu melihat kitar semula sebagai satu isu penting kerana tahap pengetahuan mereka terhadap alam sekitar, mereka pasti akan berusaha meluangkan masa dan tenaga untuk menyertai aktiviti kitar semula. **Objektif**: Untuk mengkaji tahap pengetahuan, sikap dan amalan terhadap aktiviti kitar semula di kalangan pelajar sekolah menengah di Hulu Langat. **Metodologi**: Seramai 500 responden yang memenuhi kriteria telah dipilih di dua buah sekolah di Hulu Langat. Pelajar tingkatan enam dan pelajar yang tidak dapat membaca serta menulis tidak termasuk dalam kajian ini. Borang soal selidik telah digunakan untuk mengetahui tahap pengetahuan, sikap dan amalan mengenai aktiviti kitar semula dan mendapatkan maklumat demografi sosial. **Keputusan dan Perbincangan**: Tahap pengetahuan, sekolah bandar dan luar bandar telah menunjukkan tahap sederhana iaitu 185 (74.0%) dan 201 (80.4). Tahap sikap bagi sekolah bandar dan luar bandar juga tahap sederhana iaitu 195 (78%) dan 193 (77.2%). Sementara itu, untuk tahap amalan kedua-dua lokasi sekolah menunjukkan amalan buruk terhadap kitar semula iaitu 176 (70.4%) bagi sekolah bandar dan 190 (76.0%) bagi sekolah luar bandar. Kajian ini mendapati bahawa, perbezaan min pengetahuan ($p<0.05$, $p=0.018$) dan amalan ($p<0.05$, $p = 0{,}012$) antara sekolah bandar dan luar bandar. Walau bagaimanapun, tiada perbezaan min sikap antara sekolah bandar dan luar bandar ($p> 0.05$, $p = 0.581$). Disamping itu terdapat juga perkaitan antara umur dengan sikap ($p <0.05$, $p = 0.018$) dan tahap amalan ($p <0.05$, $p = 0.00$). Tahap pengetahuan dan tahap amalan telah menunjukkan perkaitan dimana pelajar berpengetahuan sederhana cenderung untuk kurang melaksanakan aktiviti kitar semula ($p <0.001$, $p = 0.00$). Terdapat juga kaitan antara sikap dan amalan kitar semula ($p <0.01$, $p = 0.00$). Pelajar dengan sikap sederhana, cenderung untuk kurang melaksanakan aktiviti kitar semula. **Kesimpulan**: Sekolah menengah dari kedua-dua lokasi sekolah mempunyai pengetahuan dan sikap yang sederhana manakala amalan yang buruk terhadap aktiviti kitar semula. Pelajar sekolah bandar dan luar bandar mempunyai perbezaan dari segi pengetahuan dan amalan bagi aktiviti kitar semula kerana sekolah bandar telah terdedah kepada pelbagai teknik pengurusan sisa.



**Kata kunci**: Pengetahuan, sikap, amalan, kitar semula, pelajar sekolah menengah

# TABLE OF CONTENTS

**CHATER 2: LITERATURE REVIEW**

**CHAPTER 4: RESULTS**

**CHAPTER 5: DISCUSSION**

## LIST OF TABLES

## LIST OF FIGURES



## LIST OF DIAGRAM

## LIST OF APPENDIXES

## LIST OF ABBREVATIONS

| | |
|---|---|
| KAP | Knowledge, Attitude and Practice |
| MFC | Malaysia Federal Constitution |
| MHLG | Ministry of Housing and Local Government |
| MOE | Ministry of Education |
| SW | Solid Waste |
| SWM | Solid Waste Management |
| 3R | Reduce, Reuse, Recycle |
| WHO | World Health Organization |

# CHAPTER 1

# INTRODUCTION

## 1.1 Background

Solid waste generation is one of the major environmental problems faced by municipalities in the world (Omran, 2008) and in Malaysia as well. Solid waste is considerate as sanitation issue in Malaysia Federal Constitution (MFC). It is stated under the Concurrent List of Ninth Schedule. Throughout the time solid waste management (SWM) in Malaysia developed after the restructuring of the local authorities; when the Local Government Act 1976 came into action. The first attempt by Ministry of Housing and Local Government (MHLG) use scientific and engineering approach to analyse and provide solution to solid and waste management in Peninsular Malaysia by solid waste management.

Solid waste management (SWM) is defined as the control of waste generation, storage, collection, transfer and transport, processing and disposal solid waste (SW) (Omran, 2008). Simply, it also can be define as discipline associated with the control of generation (Tchobanoglous *et al.,* 1993). Hierarchy of solid waste management can be shown as Figure 1.1. New National Solid Waste and Public Cleansing Management Corporation enacted on September 2007 is a proactive step towards achieving the sustainability of solid waste management as a long term solution (Tarmudi *et al.,* 2009).

Proper solid waste management is necessary in preventing further environment destruction and in promoting sustainable development (Agamuthu *et al.,* 2009). More specifically, in Malaysia solid waste in managed by the Ministry of Housing and Local Government, the State Government, Department of Environment (DOE) and Local Authority participation of the private sector (Bakri, 2003).

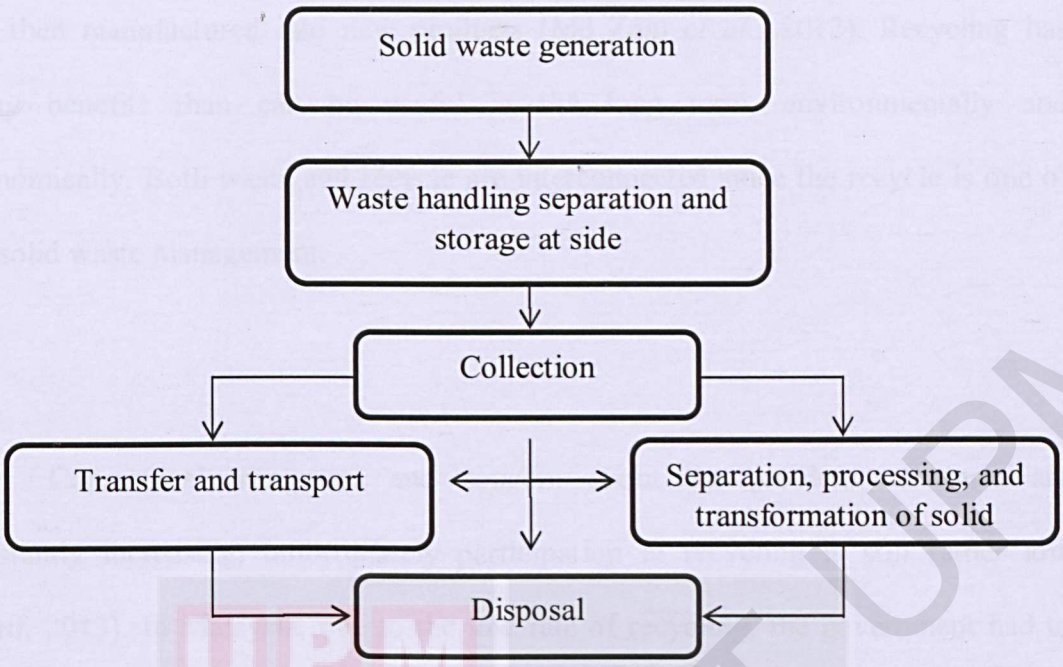


Figure 1.1: Hierarchy of Solid Waste Management (Shah, 2000)

The increasing solid waste year by year have made our earth does not have enough capacity or space to support all the solid waste. This situation is getting worse for Malaysia to obtain new land because of land scarcity and the increase of land prices and high demands due to the increase in population (Manaf *et al.*, 2009).

Thus, the best way to solve this issue by encourages people especially the younger teenagers such as school students to do the recycling activity. The recycling and recovery of waste and diverting waste away from landfill play a key in tackling the environment impact of increasing waste volumes. Recycling is term to describe the procedure by which waste is collected, sorted and processed into new materials

and then manufactured into new products (Md Zain *et al.,* 2012). Recycling has many benefits than can be useful in the long term, environmentally and economically. Both waste and recycle are interconnected since the recycle is one of the solid waste management.

Consumers' awareness and concern about the problem of waste are constantly increasing, unfortunately participation in recycling is still rather low (Latif, 2013). In Malaysia, due to the low rate of recycling, the government had to launch the National Recycle Programme not only once but twice again in 2001. However, seven years after the re-launch, the result is still comparatively the same (Omran *et al.,* 2009). The failure of the campaign has been succinctly noted by the Minister of Housing and Local Government:

*"I am un happy with the result; the government can only plan and advice, the rest is up to the people. After more than two years of recycling campaign, only 2% of waste is recycle and it takes only nine and a half days to fill the PETRONAS twin towers with garbage"*

Sources: (Omran, 2008)

In fact, the figures quoted are way below the government's target of increasing the nation's recycling rate to 22% by 2020 which would require a drastic transformation in habits and attitudes (Table 1.1).

**Table 1.1: Government's target of increasing the national's recycling rate**

| Year | Total waste generated (tonnes years) | Recycling rate (%) |
|---|---|---|
| 2001 | 160,600 | 3.0 |
| 2002 | 164,615 | 4.0 |
| 2003 | 168,730 | 5.0 |
| 2004 | 172,949 | 6.0 |
| 2005 | 177,272 | 7.0 |
| 2006 | 181,704 | 8.0 |
| 2007 | 186,247 | 9.0 |
| 2008 | 190,903 | 10.0 |
| 2009 | 195,676 | 11.0 |
| 2010 | 200,567 | 12.0 |
| 2011 | 205,582 | 13.0 |
| 2012 | 210,721 | 14.0 |
| 2013 | 215,989 | 15.0 |
| 2014 | 221,289 | 16.0 |
| 2015 | 226,924 | 17.0 |
| 2016 | 232,597 | 18.0 |
| 2017 | 238,421 | 19.0 |
| 2018 | 244,372 | 20.0 |
| 2019 | 250,481 | 21.0 |
| 2020 | 256,743 | 22.0 |

Sources: (Omran, 2008)

According to Budhiarta *et al.,* (2012), Malaysia's attitude towards recycling is higher, but only few practice it due limited activity take place. Knowledge of the existence of recycling program and the knowledge complying with the rules and the regulation are thought to be the basic issues that prevent individuals from participating in recycling activity. Salhofer and Isaac, (2002) found that public relations could be used as a tool to educate and motivated individual into participate in recycling programmes. It is not easy for every individual to practice the recycling since there are many factor influences by situational factors such as the amount to effort involved, inconvenience, storage space and access to recycling schemes, (Omran *et al.,* 2009).

In addition, the success of recycling activity not only from individual participation and understanding, but poor designed and implemented campaign, promotion campaign will mean that participation rates will continue to remain low. Tonglet *et al.,* (2004) suggested that attitude is major contributor to recycling behaviour which these attitude are influenced firstly by having the appropriate opportunities, facilities and knowledge to recycle.

Therefore responsible is placed on everyone especially government hand to implement effective programme that consider the needs of individual and the environment which can adopt environmentally friendly behaviour and if individual

perceive that recycling is an important issue, perhaps because of their knowledge, they will surely invest their time and effort in recycling programme (Asmuni *et al.*, 2012). However, another stakeholder such as private company, NGO's and public must also responsible in order to make sure the recycling activity are successful.

### 1.1.1 The problem of waste

a) Worldwide

According to UNEP (2013), Municipal Solid Waste generated worldwide was estimated for about 1.7 – 1.9 billion metric tons. In beginning of human life, the disposal of solid waste did not pose a significant problem as the population scale was smaller and the amount of the land available for dispose the waste (Zia & Devadas, 2008).

As the development is increasing, it has created the huge number of population which they are the one that dumping the waste on earth. Municipal waste volumes are rising over the years almost everywhere in the world. The increase and

complexity has thus, created a need to device appropriate waste disposal methods to ensure a clean and healthy environment (Ichor *et al.,* 2014).

Future project estimate show that the world's waste production could reach up to 27 million tons by 2050, a third of which may be generated in Asia, with a significant percentage of that being produced in large economies such as China and India (World Bank, 2005).

From that, electrical and electronic waste (e-waste) are the waste that being concern because of rapidly growing. About 20-50 million tonnes of e-waste were generated worldwide in 2005 and it will increase by 200-500 per cent over 2007 level (UNEP, 2005). These types of e-waste contain a metal such as mercury, cadmium, and lead which have a high chance to leach into the environment and pose a health hazard to human health.

b) Malaysia

Over the past 10 years, generation of Malaysia waste has increase more than 91 % (Manaf *et al.,* 2009). Therefore in 2001, about 5.475 million tonnes of solid

waste was estimated which is 0.81 kg/capita/day (Ngoc and Schnitzer, 2009) while slightly higher at the urban area which is 1.7 kg/capita/day.

In Malaysia, the country is producing waste more than 15000 tonnes per days (Yakob et al., 2012) and by the year 2020, it will reach the weight of 30000 tonnes per day (CAP, 2010). The Ministry of Housing and Local Government (2001) pointed out that the amount of the waste generation in Malaysia is projected to increase at 3.4 % per year (Table 1.2). This amount of the waste can be increasing one day which it will reach the height of the PETRONAS twin towers.

**Table 1.2: Estimated population and waste in Malaysia**

| Year | Population (million) | Estimated waste (Tons/year) |
|---|---|---|
| **1991** | 17567000 | 4488369 |
| **1994** | 18917739 | 5048804 |
| **2015** | 31773889 | 7772402 |
| **2020** | 35949239 | 9092611 |

Sources: Ministry of Housing and Local Government (2001)

c) Selangor

Municipal solid waste generation in urban areas in Selangor from 1970 to 2006 shows increasing in number of solid municipal waste from 2380 tons to 3904 tons (Yakob et al., 2012). This proved that Johor, Kuala Lumpur and Selangor are the top three that generate the municipal waste in high quantity.

However, based on statistic from Ministry of Housing and Local Government (2012), 16,247 tons were being generate every day in Malaysia, which showed that, Selangor has higher number of production of the solid waste compare to others states that produce about 2,955 tons per day.

In addition, Selangor is considering building a state of the art sanitary landfill nearby Kajang store solid waste collected daily by the local council. About 5000 tonnes of solid waste had being collected daily at Kajang which almost 30 percent of it is unfit for recycling and has to be disposed of at landfills. About 400 to 500 tonnes metric of municipal was being recorded at a few places of Kajang within a few days (Selangor Times, 2013). Therefore, recycle activity is very critical important in order to reduce the generation of waste in Selangor.

## 1.2 Problem Statement

The municipal solid waste management practice in Malaysia is inclined to the end of pipe approach, where all waste will be treated and disposed of at the landfill, and as a result it increases the volumes of waste reaching landfills (Moh and Abd Manaf, 2014). The collection system of municipal solid waste is currently experience certain problem such as littering around communal bins and the existence of different bin sizes and bin weight which collection difficult (Sreenivasan *et al.,* 2012).

Several methods have been proposed in order to combat this problem. Perhaps the most popular of these is the simplest building the new landfills on the county outskirts. This situation makes the Malaysia country difficult to obtain new land because of land scarcity and the increase of land prices and high demands due to the increase in population (Manaf *et al.,* 2009).

Solid waste landfill sites have a number of negative environmental impacts, especially if these sites are not properly managed. Besides that, inappropriate solid waste management causes air, soil, and water pollution. The solid waste materials block drainage system, causing overflows during rainy seasons especially in urban regions (Aziz *et al.,* 2010). Moreover, the urban poor suffer disproportionately from

bad environment sanitation, formally waste collector and recyclers, resulting in illness cause water and vector borne disease (Towns, 2014).

Furthermore, in Malaysia until 31 December 2010, 114 out of 290 solid waste disposal sites had been closed. Approximately 18% of the remaining disposal sites are exceeding its capacity while 20% more had the lifespan of less than 2 years. From 176 solid waste disposal sites, only 46 sites have the lifespan of 5 years and more (MHLG Selected Statistic, 2010).

Thus, to reduce the amount of waste being disposed at landfills sites, the public needs to start reducing their waste then follow by reused and recycle (3R). Others have proposed stronger recycling campaigns and larger per- bag waste disposal costs as a way to lessen the potential damage of our trash situation. Although consumers' awareness and concern about the problem of waste are constantly increasing, participation in recycling is still rather low (Latif *et al.,* 2013).

A recent survey by the Ministry of Housing and Government 2011 showed that, most of the respondents admitted that they were aware of recycling programmes but a few of them actually participate in recycling. The non- recycle group in Malaysia is dominated by the low income group with low level of education, living

in single story houses and being predominately Malay (Zen *et al.,* 2014). Thus, younger generation especially students need to be educated on how to practice recycle in their daily life.

It can be proved from a study conducted in West Coast City, United States has found that school system is a major waste- producing sector (Md Zain *et al.,* 2012) and canteen is a major contributor of waste in schools (Zahari, 2012). Thus, recycling activity in school will be one of the means to reduction in national total of waste and at the same times we can encourage a student to participate in recycling activity.

In addition, the ultimate objective of recycling activity in schools is to increase the student's awareness of the important of the practice so that they will become more responsible in the future (Nguyen, 2011), making recycling as a culture in their life. Malaysia students treated the environmental education just as one of the academic topics for them to study, without real connected to their lives and the world beyond the classroom (Thang, 2006).

Generally, Malaysian secondary school students have the knowledge and the awareness on environmental education, however, they are missing to see the values of it, thus, they are not translating their knowledge into environmental practice (Hassan & Mohd. Nor, 2013). This could be one of the reasons of low involvement in environmental awareness practices such as recycling among the school students. This finding could be strengthened by a study in San Rafael where a manager of recycling centre noted that adolescent between 13 and 25 showed the lowest participation in recycling (Wilcox, 2014).

In order to address this issue, the study of knowledge, attitude and practices towards recycling activity among secondary school student need to be done since there is still lacking of research to study the behaviour of school students in this particular issue.

## 1.3 Study Justification

Generally there were researches conducted about the significant different between the resident population and cooperation with various organizations towards recycling activity but less of the specifically conducted among secondary school students in Malaysia. Thus, it is good to know whether the school students nowadays have the environmental knowledge and awareness. Moreover, outcome of this study will contribute valuable information related to the level of knowledge; attitude and practice of secondary students towards recycling activity.

In order to make recycling successful, young generations need to be nurture the practice from the earliest stage as possible. Adolescence is the best stage to start this practice because of understanding environmental issues begins in this phase, secondary school students is appropriate target group under this circumstances. In Selangor itself, there are about 269 number of secondary school at Selangor. This shows that, the large number of students can be obtain form this amount of secondary school in Selangor. So, it will be opportunity in order to influence and educate the students to practice of recycle.

Thus, the purpose of this study is to determine the recycling behaviour among the secondary school students since in earlier education and awareness was given could increase the recycling activity especially in reduce, reuse and recycle (3R) programmes.

Moreover, the outcome from this study could be as the baseline information for the government on how to encourage the student to understand about the recycling and make them to practice it every day. This is crucial part since the easier way to teach them is start form the school and they will be more understand and able to protect the nature.

## 1.4 Conceptual Framework

Figure 1.2 shows the summary of conceptual framework of this study. The conceptual framework summaries on institution especially secondary school students that located at rural and urban area on the recycling practice which influence by the independent variable.

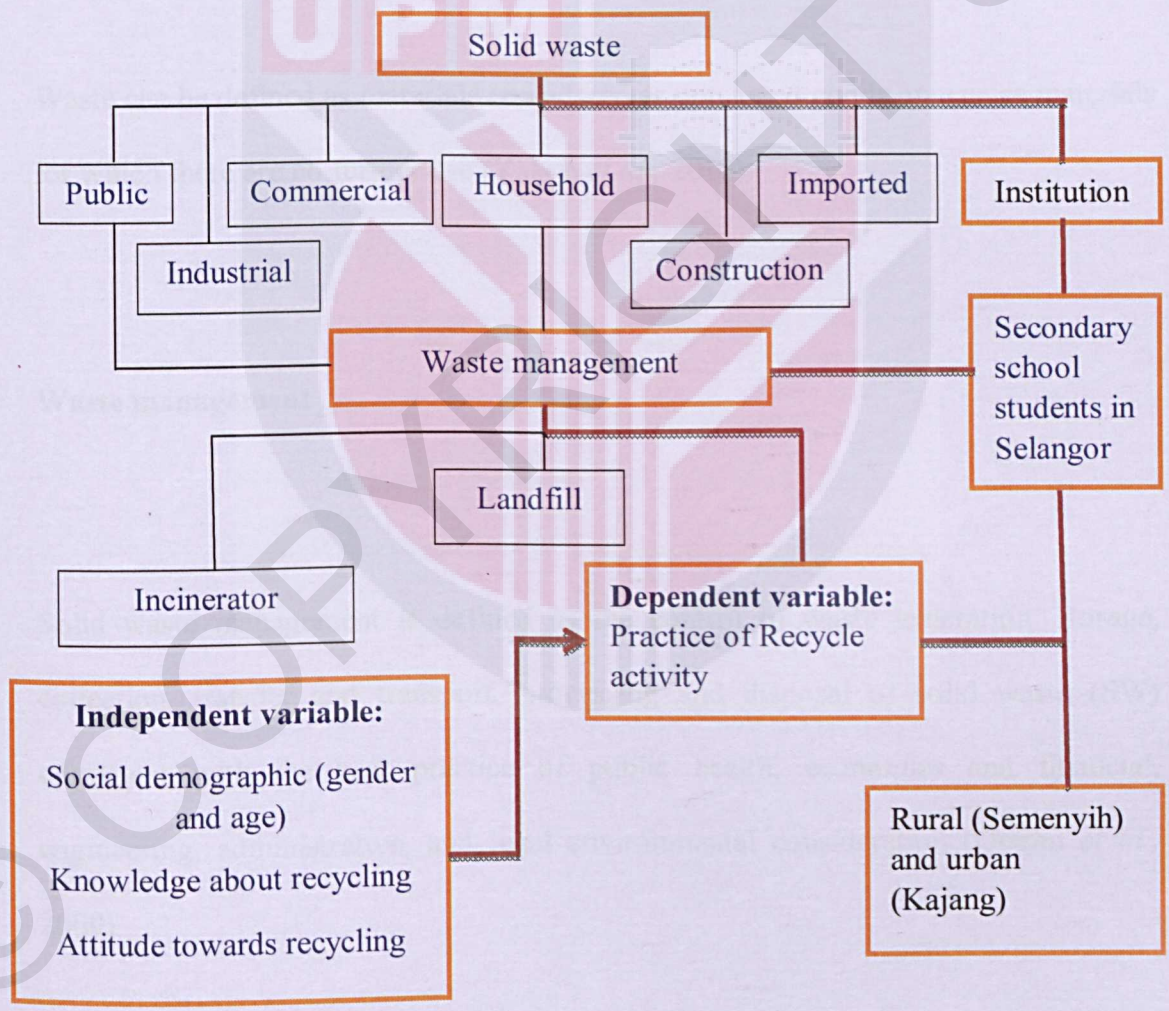


**Figure 1.2: Conceptual Framework**

## 1.5 Definition

### 1.5.1 Conceptual Definition

- **Waste**

Waste can be defined as materials considered as unwanted goods or seen as materials for which there are no further use (Yakob *et al.,* 2012).

- **Waste management**

Solid waste management is defined as the control of waste generation, storage, collection, transfer and transport, processing and disposal of solid waste (SW) consistent with the best practice of public health, economics and financial, engineering, administrative, and legal environmental consideration (Omran *et al.,* 2009)

- **Recycling**

Recycling is one of the practices in waste management which lies under the 3R implementation. It is the main component in the 'Reduce, Reuse and Recycle' waste hierarchy (Md Zain *et al.,* 2012)

- **Rural and urban area**

Rural area is defined by exclusion as an absence of urbanism, or may be thought to have distinct exposures of their own, such as those derived from agriculture and other rural industries, or lack access to health care. Urban area is defined as a city that has been developed by urbanization process causing an increase in population size and density over time (Susan *et. al,* 2006).

- **Socio-demographic**

Socio-demographic is characterized by a combination of sociological and demographic characteristic. For example, age, gender, race, education level, etc.

- **Knowledge**

Knowledge is a precondition for environmental awareness to ignite in individuals. It is the students' ability to understand and evaluate the impact of a society on the ecosystem (Rosta *et al.,* 2011)

- **Attitude**

Attitude defined as manner, disposition, feeling, position, with regard to a person / things tendency / orientation especially of the mind a negative attitude. Attitude can be in the form of likes and dislikes, biases, views, feelings concerning a situation or issue (Sammut, 2013).

- **Practice**

Practice is the observable actions of an individual in response to a stimulus. This is something that deals with the concrete, with actions.

- **Secondary school students**

A school for student that is between ages of 13-17 years old.

1.5.2 Operational Definition

- **Recycling Activity**

Recycling activity is the process of collecting, sorting and reprocessing certain materials which considered as waste into a new product. The concept of recycling process is the waste materials are process to produce the new product of the same materials.

- **Rural and urban area**

In this research, it was focus in rural and urban area. Both rural and urban is chosen as the sampling location to distribute the questionnaire. Kajang was chosen as the urban areas meanwhile Semenyih was chosen as rural area.

- **Socio-demographic**

Socio-demographic factor was measured by using self-administered questionnaire consist of question such as age, race and gender.

- **Knowledge**

It was evaluated by using self-administered questionnaire consist of question regarding the general information about the types of recycle waste, how to recycle and important of recycle. Closed- ended question which is yes and no question then will be evaluated into good and poor practice.

- **Attitude**

It was evaluated by using self-administered questionnaire consist of question on attitude that should they have regarding the recycling activity. 5 scale types is use to evaluate the attitude which then will be classified into good, moderate and poor attitude.

- **Practice**

It was evaluated by using self-administered questionnaire consist of question on practices that should they do to the waste that they produce. Yes and no question then will be evaluated into good and poor practice.

- **Secondary school student**

The selection of the students was based on their age which is between 13-17 years old because their knowledge on exposure to recycling activity.

## 1.6 Research Objectives

### 1.6.1 General objective:

To study the knowledge, attitude and practice towards recycling activity among secondary school students in Hulu Langat.

### 1.6.2 Specific objectives

a) To determine the social demographic characteristics distribution among respondent.

b) To compare the knowledge's score of recycling activity between two groups of respondents (students from rural and urban areas).

c) To compare the attitude's score of recycling activity between two groups of respondents (students from rural and urban areas).

d) To compare the practice's score of recycling activity between two groups of respondents (students from rural and urban areas).

e) To determine the association between knowledge, attitude on practice of recycling activity among respondents.

### 1.7 Study hypothesis

a) There is a significant difference on knowledge's score of recycling activity between two groups of respondents (rural and urban area).

b) There is a significant difference on attitude's score of recycling activity between two groups of respondents (rural and urban area).

c) There is a significant difference on practice' score of recycling activity between two group of respondents (rural and urban area).

d) There is an association between the knowledge, attitude on practice of recycling activity among respondents.

# CHAPTER 2

# LITERATURE REVIEW

This chapter discuss the study by previous researcher regarding recycling activity among school students. This chapter explain on the definition of recycling and waste management, recycling behaviour among secondary school students, knowledge attitude practice, impact of solid waste to environment and human, benefits of recycling and the determinants that influence that behaviour.

## 2.1 Definition of Waste and Recycling

Solid waste management is defined as the control of waste generation, storage, collection, transfer and transport, processing and disposal of solid waste (SW) consistent with the best practice of public health, economics and financial,

engineering, administrative, and legal environmental consideration (Omran *et al.,* 2009).

Waste can be defined as materials considered as unwanted goods or seen as materials for which there are no further use (Yakob *et al.,* 2012). Based on Banga, (2013) solid waste is a by-product of human and animal activities which can be classifies in term of their original use (such as packaging waste), the material (glass, paper, or plastic), their physical properties (combustible or biodegradable), their origin (domestic, commercial, industrial or agriculture), and the safety parameters (hazardous or radioactive).

Furthermore, recycling is a process of turning used material into new product without having to reproduce it from stage zero (Balqis, 2009). It is a part of the element in waste management and it is a part of the 3 R's component in the waste hierarchy which is recycle, reduce and reuse.

Waste recycling is an efficient and effective solid waste management system (Rabinson, 1986). Certain waste may become other- valuable resources once they are altered from their origin (Wei *et al.,* 1997). It is resources conservation activity which may provide greater return for many products in energy saving (Khajuria *et*

*al.,* 2010). Plastic, paper and glass are among three types of waste that identified as the greatest potential for recycling (Tarmudi *et al.,* 2009).

## 2.2 Overview of Recycling Behaviour among Secondary School Students

The secondary school was chosen as the target age group for this study due to the potential impact their actions could have on the community, however further research demonstrated that this age group often displays apathy towards academics and surrounding issues. Students can also act as teachers while they are in high school. Parents and siblings are influenced by the message students bring home from school.

It is also important to focus on high school students because adolescents are still impressionable and with the proper education can accept concepts such as civic duty and sense of pride. One particular theory, self-efficacy is the belief that one's actions have an effect on the surroundings. Self-efficacy is believed to be one of the biggest motivations to create deep "cognitive strategies' (Greene *et al.,* 2004).

A more in depth education may help a student become someone who is a result of their interaction with the world and someone who influence the "nature and quality of those interactions". They key to developing such meaningful interactions is to motivate high school students so that they realize the importance of their time and thoughts as a student (Greene *et al.,* 2004).

Moreover, the best part to educate the people since they are young. A study mentioned that school students can make potential contribute in addressing environmental problems within their local communities (Adeolu *et al.,* 2014). According to Mahmud and Osman (2010), environmental education in Malaysia was introduced to increase the awareness on environmental issues including recycling. Most of secondary schools students knew about recycling and it is important but the recycling level still low. Some research found that, important of environment education was not stressed and therefore, they do not really see the need to practice the recycling activity (Thang, 2006).

Zahari (2012) reported that the recycling participation among secondary schools students in Penang still low due to lack of recycling bins and awareness programs. Other than that, students are easily discouraged from participation when inconvenience experience as they do not have a strong personal obligation to recycle

(Zahari, 2012). Families and friends did not recycle was also contribute to the attitude of student to practice the recycle.

## 2.3 Knowledge, Attitude and Practice

To ensure that the next generation can live in the safer zone, it is necessary for the government to take action by increasing public awareness especially among young generation towards proper waste management through education (Yakob *et al.,* 2012). Environmental knowledge and attitude of individual should be examined in order to understand their behaviour and how to encourage the waste separation and recycle a waste at generating sources (Singhirunnusorn, 2012). Knowledge levels about the specific recycling programs correlate with recycle rates, suggesting that recycling behaviour may be less related to knowledge in general than to knowledge about the specifics of recycling (Kaiser *et al.,* 1999).

Generally individual will likely to recycle when they have more information about which materials are recyclable (Latif *et al.,* 2013). According to Sidique *et al.,* (2010), the different between those who is recycle and non-recycler is their knowledge about which items are suitable for recyclable. Various sources of recycling knowledge coming from public education and information through public

campaign are expected showing a positive correlation with recycling rate (Singhirunnusorn, 2012).

Most Asian country has made efforts to introduce environmental education at primary, secondary and tertiary level (Yakob *et al.,* 2012). Therefore, in 1994, the Malaysia Ministry of Education has introduced the environmental education but the implementation was not successful (Yakob *et al.,* 2012). Based on the study by Kaiser *et al.,* (1999), behaviour of student can be change by changing their belief since the belief is influence by attitude.

The individual are still not able to translate their concerns to act upon this recycler. It is important to understand attitude about recycle, because if people see no benefit to an activity they will not participate in it (Zurmuhlen, 2010). Attitudes reflect the learning impacts on behaviour (Greenwald and Banaji, 1995). Hence, if attitude are changing due to education, then this will indicate that the current education system influences strongly on students life and their thinking (Ferdous, 2013).

According to Eves *et al.,* (2007) attitudes were built up with affective customs of emotions or feeling. Cognitive formulations regarding belief, opinions, and behavioural conduct regarded how one should behave towards the project (Ferdous, 2013). Thus more effective efforts toward educating the community about proper household waste recycling etiquette are necessary in order to see the progress in the recycling rate (Moh and Abd Manaf, 2014).

## 2.4 Impact of the Solid Waste to the Environment and Human Health

In Malaysia, the preferred method practiced for the disposal of waste is through landfill due to it is the cheapest cost and most common method to treat solid waste (Manaf *et al.,* 2009). Usually most of the landfill is open dumping areas. The main concern about the open dumping landfill is it gives a lot of severe impact on environment and human health (Ngoc and Schnitzer, 2009). People can get the effect from the exposure of the soil contaminant through direct waste contact, air pollution through burning of waste and worse scenario is spreading disease by the different vectors like birds, insects and rodents (Samsudin and Don, 2013).

When waste is deposited in the landfills cell, the water content inside the waste and water from rainfall and surface water drainage will lead to leachate production which lateral movement will happen when an impermeable immediate cover is used for daily cover and this may cause surface water contamination (Aziz *et al.,* 2010). The vertical movement will bring leachate passed through rock and reach the aquifer. The leachate which picks up soluble heavy materials such as heavy metals and acids in the waste will eventually contaminate the ground water. If this ground water is extracted as drinking water supply, it can be hazardous to human (Catin *et al.,* 2013).

At the landfill site, there are large amount of landfill gases will be emitted to the atmosphere during the waste degradation process which mainly consists of carbon dioxide and methane (Fauziah and Agamuthu, 2012). With its high emission of methane, at about 50% to 60%, landfill has been regarded as one of the major sources of methane emission (Fauziah and Agamuthu, 2012). According to some research, the release 1 kg of methane will cause an equivalent contribute to 35 kg of carbon dioxide ($CO_2$) to global warming over a 20 year time span (IPCC, 1996).

Moreover, uncontrolled dumping at the dumpsite poses a significant hazard not only to the site workers but also those who live close to the disposal facilities and those who derive their income from these sources (Marshall and Farahbakhsh, 2013).

Most of the times, local authorities always receive public complaint about bad smell and odour coming from the open dumpsites and landfills without daily soil cover (Alhumoud, 2005).

Poorly managed dumpsites and landfills are also the breeding bed for vector-borne disease such as dengue fever whose prevalence can be traced to poor waste disposal. Study done in India show that, household experience at least one episode of gastrointestinal illness in a one month period and another 18% at least one episode of typhoid or cholera or jaundice during the one year period due to reuse of untreated waste in agriculture (Masirin *et al.,* 2008)

Many human diseases are linked to improper solid waste management. Solid waste such as flowerpot, tyres, plastic container was possible breeding habitat for mosquito. The litter the landscape were significantly contributing to mosquito disease and at the end it will contribute to the higher cases of dengue fever. In addition, flies and cockroach related problems tend to arise when there is a food source such as flies that are attracted to waste or unsanitary condition which they can carry various diseases, including cholera, diarrhea, typhoid and dysentery (Rohana *et al.,* 2010).

Other than that, study show that waste management at rural area is uncontrolled. This is due to the waste collection only cover 66% of the population at rural area throughout the Malaysia (Samsudin and Don, 2013). Thus, some rural area will simply dumped the waste on the streets and drain which in future serious environmental and social treats like flooding, breeding of insects and rodent vector will cause harm to human health (Zurbrügg, 2003).

## 2.5 Benefit of Recycle

Recycle brings us some important to our next generation and to bring the environment look clean and fresh. Recycling activity could save landfills spaces which are the dumping waste occur. In Japan, only 25-30% of waste goes to landfill while the rest is either burned or recycled. They calculate that if 21.2% recyclable portion of waste is recycling into new product, then 1054,219 m3 of landfill is saving by 57,029 tonnes of waste going to sites (Batool et al., 2008).

Besides that, process of recycling and reuse of waste could also save the cost for waste disposal at landfills. The government are pushing their effort to reduce the cost of solid waste management which estimated to reach RM 1 billion (Omran, 2007). Community or societies throw away 27 billion glass containers each year and

these materials are 100 % recyclable. By reuse or recycle it, can use it over and over again, and at the same time can save money plus save energy (US EPA, 2008).

Other than that, a case study in Ohio, United State of America by Franchetti, (2012) indicates that recycling has a positive impact on both greenhouse gaseous (GHG) emissions. If societies can recycle materials used like plastic, paper, tins, and others they can help to maintain the environment by reduce the pollution.

## 2.6 Factor Influence the Recycing

Gonzalez *et al.*, (2005) stated that, recycling habit can be developing among communities by several factor such as social influences, altruistic and regulatory. Government also have their own task to increase the awareness about the recycle. Minghua *et al.*, (2009) stated that recycling rates can be increase, if the government encourage markets for recycled materials and increasing professionalism in recycling companies. This time more money was used for publicity and for educating the public. Several community groups and NGOs also took and active part by spearheading recycling program and the collection of reusable materials.

Research done by Martin *et al.,* (2006) stated that, recycling paper, glass, plastic, cans and cardboard was discover three levels of recycling participation: non-recyclers (those who recycled no items), casual recyclers (those who recycled between 1 and 4 items) and full recyclers (those who recycled all) which the higher participation of recycler is among casual recycler.

However, Benton *et al.*, (1994) identified the three main reasons for non-participation in the use of recycling centres in Glasgow to be perception that the centres were too far away, apathy and a lack of interest in recycling. In other survey at the British public's attitudes to environment by DEFRA (2014) found that, the most likely reason for not recycling was the inadequacy of local facilities, followed by the facilities being too far away and a lack of storage space.

Meanwhile, according to Saujauddin *et al*, (2008), the generation of waste is influenced by family size, their education level and the monthly income. Moreover, gender, peer influence, land size, location of household and membership of environment organization effect the waste utilization and separation behaviour (Ekere *et al*., 2009).

Findings from Schultz *et al.*, (1995) found that the women were like to be more involved in recycling activity than men. However from other study done by Ebreo *et al.,* (1999) and Werner and Makela (1998) found no statistically significant relationship between recycling behaviour and gender. No literatures how men to be more cooperative than women with respect to recycling (Matsumoto, 2011).

# CHAPTER 3

# METHODOLOGY

This chapter explains the method and tools used in this research. The various sections will explain the design, duration, population and methods used for selection of research participants.

## 3.1 Study Location

This cross sectional study was conducted at Hulu Langat, Selangor (Figure 3.1). Hulu Langat is one of districts in Selangor State. Hulu Langat consist of seven sub-district namely Kajang, Hulu Langat, Ampang, Cheras, Semenyih and Beranang.

In Selangor, there are about 269 number of secondary school. Out of 269, 38 of secondary school located at Hulu Langat. In this area, two locations were being chosen based on location of school which was located at urban and rural area. School that located at Kajang and Semenyih was chosen.

There were 14 of secondary school at Kajang and 3 of secondary school at Semenyih. One of secondary school known as school "A" from Kajang was represented as the urban area. Meanwhile, the secondary school represent "B" from Semenyih which was represented as rural area.

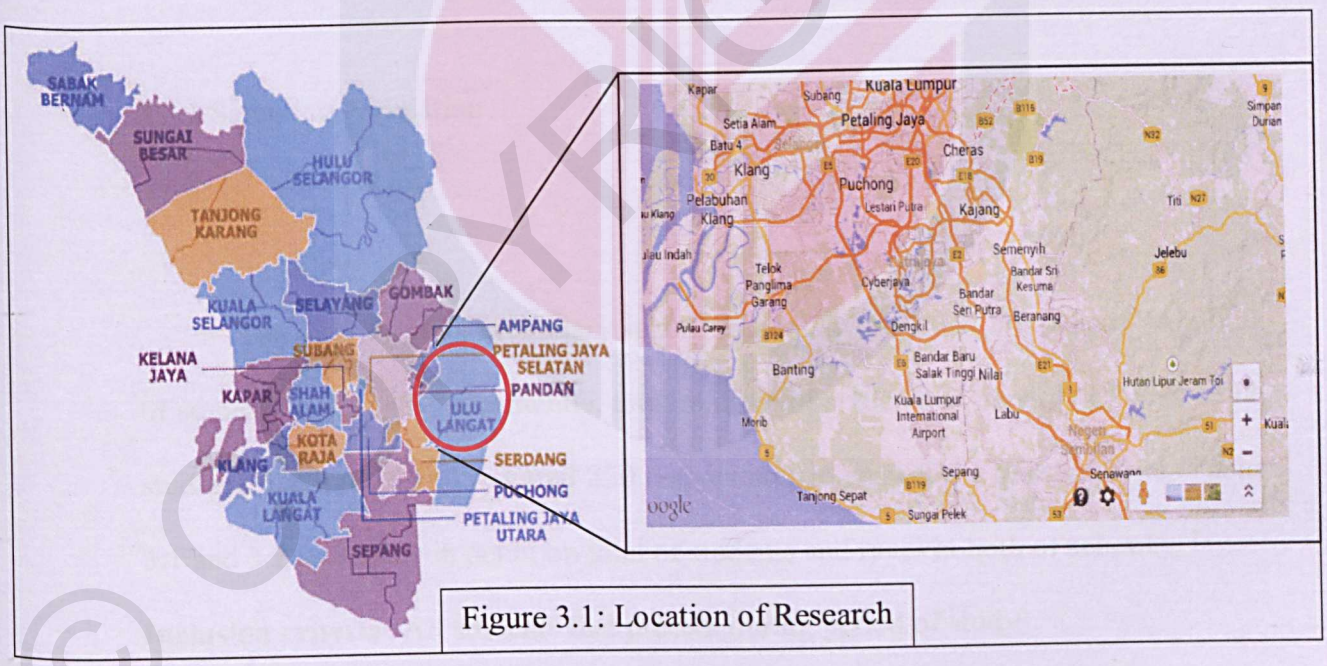


Figure 3.1: Location of Research

Sources: Google map, https://www.google.com.my/maps/place/Selangor/@

https://www.google.com.my/maps/place/Semenyih,+Selangor

## 3.2 Study Design

The research carried out a cross sectional comparative study which was to study the knowledge, attitude and practice towards recycling among secondary school students. This study involves two groups of secondary school students which were compared between secondary school at urban and rural area. Then comparison between these two groups were analysed.

## 3.3 Sampling

### 3.3.1 Sampling Population

The total for both secondary school students were 2811. For school "A" total of students were 1469. Meanwhile, total number of students at School "B" was 1342 students. Each of school required 250 respondents to answer the questionnaire. Table 3.1 and 3.2 was show in detail on total of students and races at both of school.

**Inclusion criteria:** All students that present during period of study

**Exclusion criteria:** The students who unable to read or write and form 6 students.

Table 3.1: Total number of students and races at School "A" in (February) 2015

| | Malay | Chinese | Indian | Total |
|---|---|---|---|---|
| **Form 1** | 210 | 19 | 50 | 279 |
| **Form 2** | 284 | 6 | 16 | 306 |
| **Form 3** | 225 | 22 | 32 | 279 |
| **Form 4** | 257 | 30 | 23 | 310 |
| **Form 5** | 274 | 9 | 12 | 295 |
| **Total** | 1250 | 86 | 133 | 1469 |

Sources: Latifah Binti Mohd Isa, school principal at School "A"

Table 3.2: Total number of students and races at School "B" in (February) 2015

| | Malay | Chinese | Indian | Total |
|---|---|---|---|---|
| **Form 1** | 279 | 9 | 22 | 310 |
| **Form 2** | 254 | 18 | 42 | 314 |
| **Form 3** | 230 | 28 | 34 | 292 |
| **Form 4** | 217 | 25 | 32 | 274 |
| **Form 5** | 104 | 16 | 32 | 152 |
| **Total** | 1084 | 96 | 162 | 1342 |

Sources: Penolong HEM (Hal Ehwal Pelajar) at School "B

### 3.3.2 Sampling Frame

The updated school name list was obtained from the official website Selangor Education Department. Meanwhile, the students name list was obtained from the school principal of the two schools in Hulu Langat.

### 3.3.3 Sample

Sample of student were students from form 1 to form 5 which students in two schools located in Hulu Langat, Selangor.

### 3.3.4 Sampling Unit

Student who involved were aged between 13-17 years from both secondary schools.

3.3.5 Sampling Method

For selection of the district, stratified sampling techniques was used to select district at urban and rural area. For selection of school from each district of rural and urban area, sample random sampling was used using fish bowl techniques which the list name of school was put on the bowl and randomly selected the school name and then obtained the permission from Ministry of Education (MOE) and Selangor Educational Department (JPNS).

For the selection of class Fishbowl technique was used which name of class was written on a piece of paper. Then, papers were placed in a bowl. Then, the number of pieces of paper was corresponding to the number of class needed in the sample was drawn one in time.

Meanwhile, the name list of students was obtained from school principal for selection of students in class. The technique used to select was table of random number. The number (1-30) was randomly ordered. Then, assign a number to the member of respondents and use the columns of numbers to pinpoint those respondents who was chosen to participate in study.

3.3.6 Sample Size

Study done by Nooraida *et al.,* (2012) on Exploring Secondary School Students' Belief and Attitude about waste management had obtained the mean of knowledge on recycling activity in urban and rural which is 23.1049 and 22.2982. The mean of knowledge for both urban and rural area was inserted into the Equation 3.1.

Sample size was calculated by using Lemeshow *et al.,* (1990) formula:

$$n = \frac{2\sigma^2(z1-\sigma/2+z1-ß)^2}{(\mu 1-\mu 2)^2} \qquad \text{Eq 3.1}$$

Where,

$\sigma^2$= estimated standard deviation

$\mu_1$= estimated mean (larger)

$\mu_2$= estimated mean (smaller)

$$n = \frac{(2)(4.8)^2(1.96+0.842)^2}{(23.1049-22.2982)^2}$$

= 246 respondents are needed in each of group

= rounded (250 respondents)

The total of both secondary school students were 2811. For school "A", there were about 32 classes from form 1 to form 6. Meanwhile school "B" was consists of 30 classes from form 1 until form 5. Thus, each of school required 250 students to participate in this study.

About 250 respondents were needed form each school, 50 students required from each form which was from form 1 until form 5 to make the number of students selected was equal in number. The selection of class and students who participated was randomly selected.

## 3.4 Study Instrumentation

### 3.5.1 Questionnaire

The respondents were assessed by using self-administered questionnaire was consist of 3 sections. Section A was describing their socio-demographic status, for example age, gender and race. Section B was asked about the general knowledge. Section C consist of 3 subsections which asked questions about their knowledge on

recycling activity, their attitude towards recycling activity and practices that they do related to recycling activity.

Questionnaire was modified from other research according to suitability of this research. A set of questionnaire was developed based on information gathered from previous study which done by Seow et al., (2010), Public Attitude towards recycling program: A case study in Batu Pahat, Johor.

### 3.5 Data Collection

After all application process accepted, the select students were conducted from the students name list randomly two days prior to the data collection. The selected students were gathered in a provided room. Before the questionnaire being distributed, the students were being brief on the purposed of the research and fill in the form of agreement to participate in this study. The respondents were had 15 minutes to answer the questionnaires given. A token of appreciation was given to them after completed the questionnaires.

## 3.6 Quality Control

### 3.6.1 Pilot Study

In order to ensure questionnaire reliability, a pilot study was conducted in one of the selected secondary school. There were 77 subjects whose were being pre tested for questionnaire using Cronbach alpha to test the internal reliability and consistency of questions for the whole section of the questionnaire.

The 77 pilot study questionnaire, were analyzed in the statistic Package for the SPSS version 21 to arrive at Cronbach alpha. The Cronbach alpha value of 0.72 was obtained for reliability. Bryman and Cramer (2005) stated that, Cronbach alpha value of 0.7 or more was acceptable for reliability test for questionnaire. The respondents who participate in the pilot study were not included in the full scale study.

### 3.7 Data Analysis

Data analysis was done by using "Statistical Package for Social Sciences (SPSS) Version 21.0. The test for knowledge had 10 questions. The right score 1 point and wrong answer got zero point.

For the scoring part, it was planned as follow:

1. Knowledge: the scoring method

   Right answer : 1 point

   Wrong answer : 0 point

   The obtained score were converted in term of score level and were classified into 3 levels (low, moderate and high knowledge). Possible scores, ranged between 0-10 points. A mean score and standard deviation of the group were used to classify subject into 3 groups as follow (Ajit, 2010):

   Good level : score > Mean +S.D

   Moderate level : score = Mean +/ -S.D

   Low level : score < Mean - S.D

2. The questions on attitude towards recycling activity comprised of 10 questions and following scoring criterion was followed:

   Strongly agree answer : 5 points

   Agree answer : 4 points

Not certain answer : 3 points

Disagree answer : 2 points

Strongly disagree : 1 point

The obtained score was converted in terms of score level and classified at low attitude, medium attitude and high attitude. Possible scores, ranged between 1-50 points. A mean score and standard deviation of the group were used to classify subject into 3 groups as follow (Ajit, 2010):

High attitude : score > Mean +S.D

Medium attitude : score = Mean +/- S.D

Low attitude : score < Mean -S.D

3. Practice: the scoring method

Right answer : 1 point

Wrong answer : 0 point

The obtained score were converted in term of score level and were classified into 2 levels (poor and good practice). Possible scores, ranged between 0-10 points. A mean score and standard deviation of the group were used to classify subject into 3 groups as follow (Ajit, 2010):

Good level : score > Mean +S.D

Poor level : score < Mean - S.D

Descriptive Statistics data of the mean, standard deviation was obtained. Statistical associate of the different groups was carried out using chi square on the association between two variables. Independent t-test and Man-Whitney U was used to compare between two groups.

### 3.8 Ethical Consideration

The approval from the Ethic Committee of the University Putra Malaysia was obtained before the study was started. In addition, a formal letter from Department of Environmental and Occupational Health, Faculty of Medicine and Health Science UPM was obtained for the application process to the Ministry of Education through official portal of Ministry of Education. Ministry of Education approved the application and the approval letter was forwarded to the Education District Office in Hulu Langat, Selangor.

This research was conducted on a voluntary basis where all respondents were given brief on how the study was conducted and all respondents were asked to give their written permission using agreement consent form. In order to respect the right of the respondents, the identity of the respondents including their personnel information remained confidential.

### 3.9 Study Limitation

Some selected students might not able to attend during data collection sessions due to class or other school activities. Some of student may also copy the answer among themselves. Moreover, there were some questions that need them to recall back.

# CHAPTER 4

## RESULTS

This chapter includes the descriptive and analytical findings on demographic, knowledge, attitude and practice. The descriptive finding on general information followed by descriptive characteristic on general knowledge, knowledge on recycling activity, attitude towards its recycling management and present practices on the recycling activity. Analytical findings on the comparison between group and the association of all independent variables and dependent variable were present later in this section.

In order to complete the study, 500 copy of questionnaire had been distributed. The questionnaires were distributed to the secondary school students in two different schools. Out of 500 copy, 500 (100% response rate) also were completed and been returned to the researcher. All the participants who were secondary school student of age range between 13 – 17 years old.

## 4.1 General Socio-Demographic Characteristic

This part shows frequency distribution of selected variables describing background characteristic of the respondents. Table 4.1 reveals general information such as age, sex, races, number of family and family income in school that located at urban and rural area. Diagram 4.1, 4.2, 4.3, 4.4 and 4.5 also summarized on the social demographic in bar chart and pie chart.

Regarding age, all students of each school from rural and urban were in the age ranged from 13 to 17 years old. Each of the age of the respondents consist of a same number of students which were 50 (20.0%) comprises of male and female.

Regarding sex, the study population comprises of 128 (51.2 %) females and 122 (48.4 %) males for students at rural area. Meanwhile, students at urban area comprises of 114 (45.6%) females and 136 (54.4 %) males.

For races, Malay was dominants on both schools which 173 (69.2%) for urban area and 177 (70.8%) for rural area. The rest was followed by Chinese 26

(10.4%) at urban area and 39 (15.6%) at rural area. Indian was comprised of 44 (17.6) for urban and 29 (11.6) for rural area. Others races was consist of 7 (2.8%) at urban and 5 (2.0) at rural area.

For number of family, the highest number of family members were 61 (24.4 %) comprises of 5 members and the lowest were 10 members about 2 (0.8 %). Lastly the family income was range between RM 500 – RM 37000 with mean was 3900.76 and standard deviation 3270.547

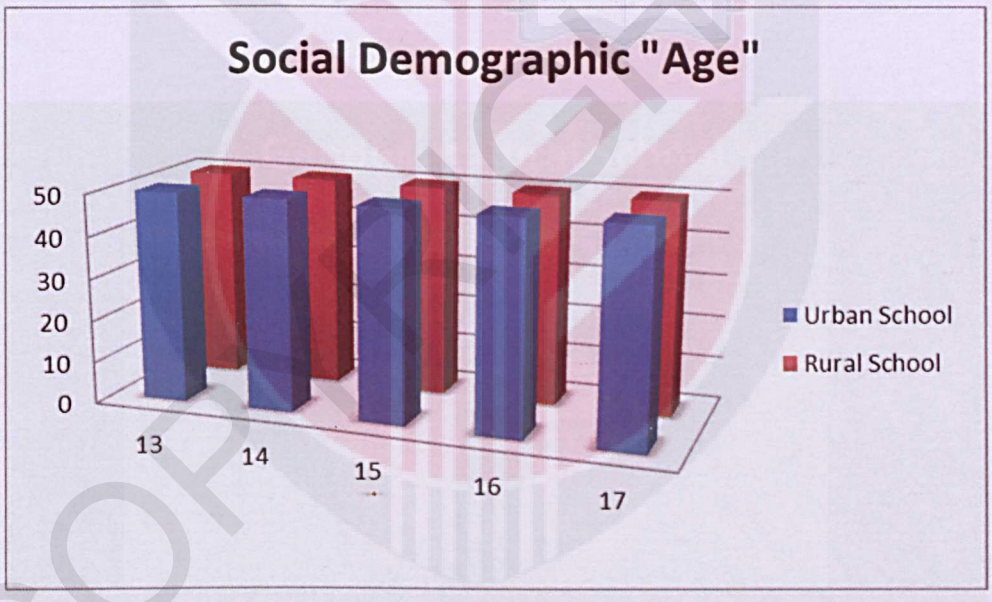


**Diagram 3.1: Age of students in School "A" (Kajang) and School "B" (Semenyih)**

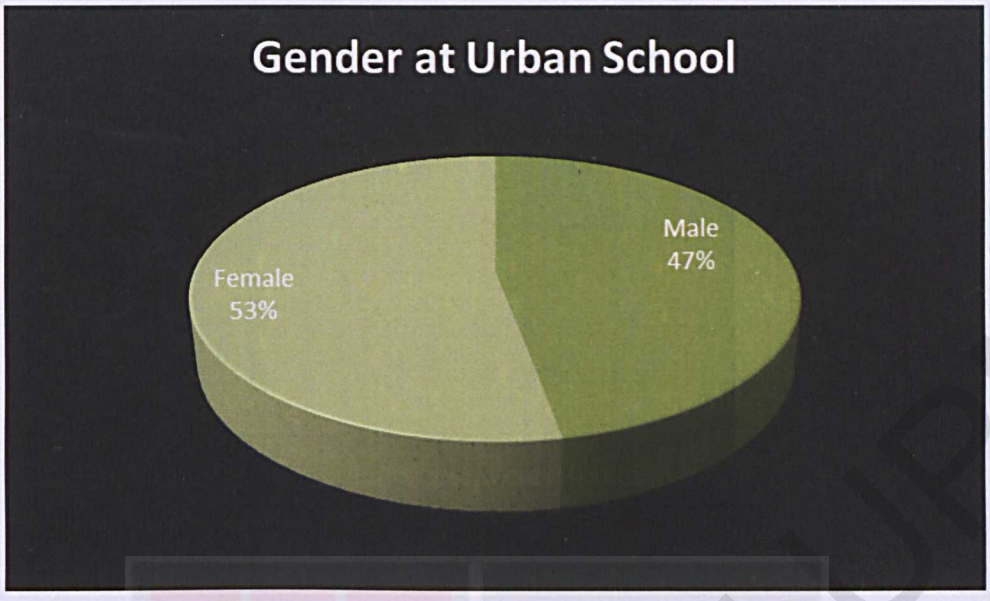


**Diagram 3.2: Gender of students in School "A" (Kajang)**

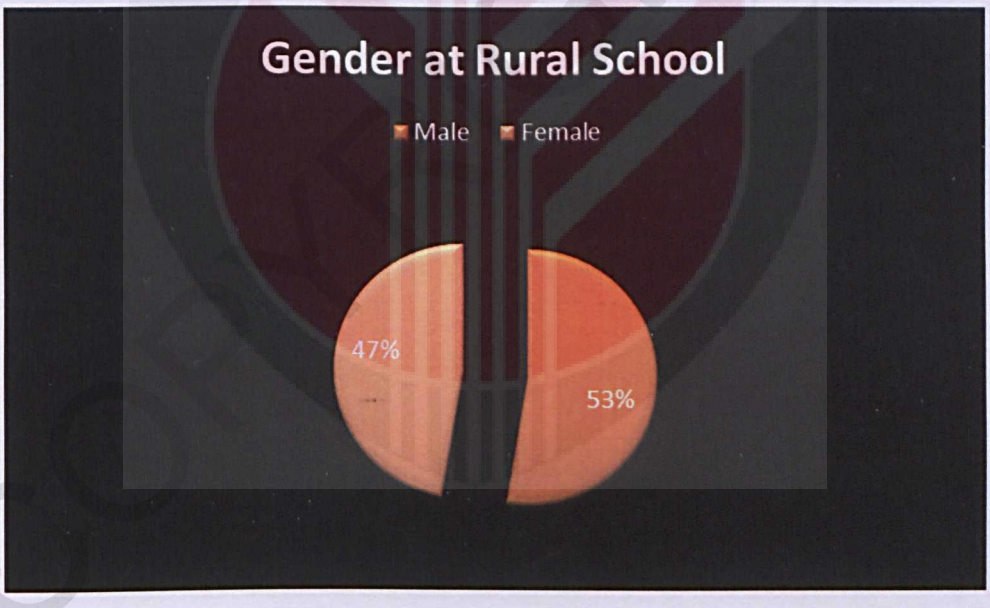


**Diagram 3.3: Gender of students in School "B" (Semenyih)**

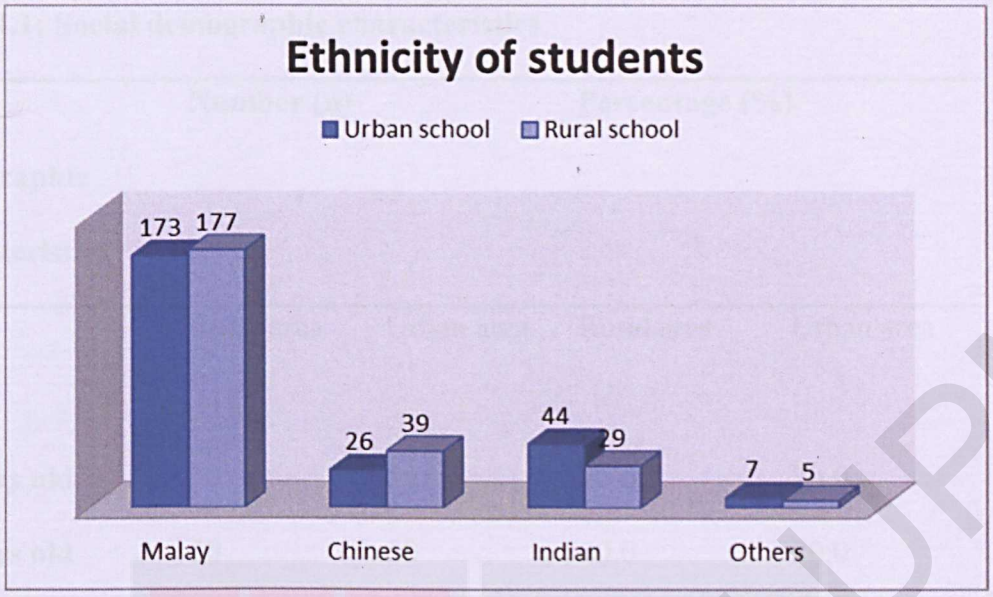


**Diagram 3.4: Races of students in School "A" (Kajang) and School "B" (Semenyih)**

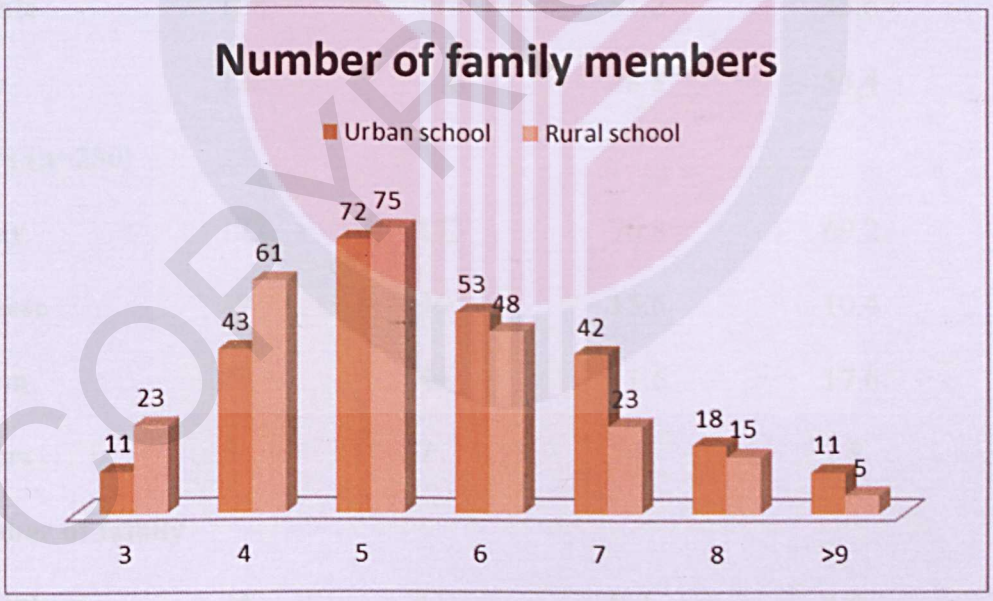


**Diagram 3.5: Number of family members in School "A" (Kajang) and School "B" (Semenyih)**

**Table 4.1: Social demographic characteristics**

| Social demographic characteristics | Number (n) | | Percentage (%) | |
|---|---|---|---|---|
| | Rural area | Urban area | Rural area | Urban area |
| **Age** | | | | |
| **13 years old** | 50 | 50 | 20.0 | 20.0 |
| **14 years old** | 50 | 50 | 20.0 | 20.0 |
| **15 years old** | 50 | 50 | 20.0 | 20.0 |
| **16 years old** | 50 | 50 | 20.0 | 20.0 |
| **17 years old** | 50 | 50 | 20.0 | 20.0 |
| **Sex (n=250)** | | | | |
| **Female** | 128 | 114 | 51.2 | 45.6 |
| **Male** | 122 | 136 | 48.8 | 54.4 |
| **Races (n=250)** | | | | |
| **Malay** | 177 | 173 | 70.8 | 69.2 |
| **Chinese** | 39 | 26 | 15.6 | 10.4 |
| **Indian** | 29 | 44 | 11.6 | 17.6 |
| **Others** | 5 | 7 | 2.0 | 2.8 |
| **Number of family** | | | | |
| **3 members** | 23 | 11 | 9.2 | 4.4 |
| **4 members** | 61 | 43 | 24.4 | 17.2 |
| **5 members** | 75 | 72 | 30.0 | 28.8 |

| | | | | |
|---|---|---|---|---|
| **6 members** | 48 | 53 | 19.2 | 21.2 |
| **7 members** | 23 | 42 | 9.2 | 16.8 |
| **8 members** | 15 | 18 | 6.0 | 7.2 |
| **>9 members** | 5 | 11 | 2.0 | 4.4 |

**Family income**

**Mean =3900.76 ± 3270.547**

**Median = 3200.00**

## 4.2 General Knowledge on Recycling Activity

This part shows frequency of general knowledge on recycling for supporting information about the recycle activity among the respondent. The table 4.2 reveals information such as they knowing about the recycling activity, the sources of information about recycling, knowing about recycling activity which was "No plastic bag day", realise on recycling program, frequency of collection of waste and number of dustbin at home.

**Knowing about recycling activity**

Regarding the question, there were 482 (96.4%) of students were known what was recycling and 18 (3.6%) of students did not know about it.

**Whether realise on recycle programme**

There were 377 (75.4%) respondents know what about recycling programme and only 18 (3.6%) does not know about it.

**Sources of information about recycling**

Majority of students in the study were chosen the television as sources to get information about recycling which are 303 (60.6%) followed from teachers 84 (16.8). The rest of sources were 57 (11.4) from magazine, 44 (8.8%) from radio and 12 (2.4%) from friends.

**Knowing about recycling programme which is "no plastic bag on Saturday"**

There were 420 (84.0%) students known a day without plastic bag while 80 (16.0%) did not about this program.

**Total number of dustbin at home**

There were 286 (57.2) students who have 1-2 dustbin at home. Meanwhile, 214 (42.8%) have about 3 or more dustbin at their house.

**Frequency of waste collection**

There were 206 (42.1%) of students agreed that waste collection was twice a week. Only 184 (36.8%) students choose once a week as their answer. A few subject 95 (19%) choose every day and 15 (3.0) never had a waste collection at their house.

**Table 4.2: General knowledge on recycling activity**

| General knowledge | Number (n) | Percentage (%) |
|---|---|---|
| **Knowing about recycling activity (n=500)** | | |
| **Yes** | 482 | 96.4 |
| **No** | 18 | 3.6 |
| **Whether realise on recycling programme (n=500)** | | |
| **Yes** | 377 | 75.4 |
| **No** | 122 | 24.4 |
| **Source of information on recycling programme (n=500)** | | |
| **Television** | 303 | 60.6 |
| **Radio** | 44 | 8.8 |
| **Magazine** | 57 | 11.4 |
| **Friends** | 12 | 2.4 |
| **Teacher** | 84 | 16.8 |
| **Knowing about recycling programme which is "no plastic bag on Saturday" (n=500)** | | |
| **Yes** | 420 | 84.0 |
| **No** | 80 | 16.0 |

| | | |
|---|---|---|
| **Total number of dustbin at home** | | |
| **(n=500)** | 286 | 57.2 |
| **1-2** | 214 | 42.8 |
| **>3** | | |
| **Frequency of waste collection (n=500)** | | |
| **Every day** | 95 | 19.0 |
| **Once a week** | 184 | 36.8 |
| **Twice a week** | 206 | 41.2 |
| **Never** | 15 | 3.0 |

### 4.3 Knowledge towards Recycling Activity

Questions were asked to explore the respondents' knowledge about recycle activity including 12 questions. The respondents got 1 score for correct answer and 0 score for wrong answer. The obtained score was converted in term of score level and was classified into 3 levels (low medium and high knowledge). Possible scores ranged between 0-10 points. A mean score of 7.02 and standard deviation of 1.557 was used to classified subjects into 3 groups as follow (Ajit, 2010).

Good level : score of 9 or more

Moderate level : score between 8-5

Low level : score of 4 below

**Table 4.3: Level of knowledge of respondents towards recycling activity (N=500)**

| Level of knowledge | Frequency | | Percentage | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| **High knowledge** | 51 | 28 | 20.4 | 11.2 |
| **Moderate knowledge** | 185 | 201 | 74.0 | 80.4 |
| **Low knowledge** | 14 | 21 | 5.6 | 8.4 |

In order to summarize the knowledge level of the respondents, the distribution of knowledge towards recycling activity was shown in table 4.3. School that located at urban area had 51 (20.4 %) of high knowledge compare to rural area which was 28 (11.2 %). For moderate knowledge, urban area had 185 (74.0 %) meanwhile rural area was 201 (80.4 %). There were 14 (5.6 %) for respondent at urban area and 21 (8.4%) at rural area had low knowledge level about the recycling activity.

**4.4 Attitude towards the Recycling Activity**

In order to know the attitude towards recycling activity, all the respondents were asked about the opinion to either agree or disagree the statements for the attitude of recycling activity. The attitude part had 10 questions. The score was given 5 for strongly agree answer, 4 for agree answer, 3 for uncertain answer, 2 for disagree answer and 1 for strongly disagree answer.

The obtained attitude score is converted in term of attitude score level and was classified into 3 levels (low, moderate and good attitude). Possible score ranged between 1- 50 points. A mean score of 34.43 and standard deviation of 5.340 was used to classified subjects into 3 groups as follow (Ajit, 2010):

Good level : score of 41 or more

Moderate level : score between 30 to 40

Low level : score of 29 or below

**Table 4.4: Level of attitude towards recycling activity (N=500)**

| Level of attitude | Frequency | | Percentage (%) | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| **High level of attitude** | 25 | 26 | 10 | 10.4 |
| **Moderate level of attitude** | 195 | 193 | 78 | 77.2 |
| **Low level of attitude** | 30 | 31 | 12 | 12.4 |

Level of attitude towards recycling activity of respondents and its distribution was shown in table 4.4. Majority of the respondents from urban and rural area had moderate attitude level which was 195 (78%) and 193 (77.2 %) while 30 (12 %) from urban and 31(12.4 %) from rural perceived as low level attitude. About 25 (10 %) from urban and 26 (10.4) rural school had shown high attitude towards recycling activity.

### 4.5 Practices towards Recycling Activity

For practice on recycle activity, all the respondents' practice was asked 10 questions. The respondents got 1 scores for true answer and 0 score for false answer. The obtained practice score was converted in term of score level and it was classified into 2 levels (good practice and bad practice). Possible scored range between 0- 10 points. A mean score of 4.79 and standard deviation of 2.484 was used to classified subject into 2 groups as follow (Ajit, 2010):

Good practice : score of 7 or more

Bad practice : score below 6

**Table 4.5: Level of practice on recycling activity (N=500)**

| **Level of practice** | **Frequency** | | **Percentage** | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| **Good practice** | 74 | 60 | 29.6 | 24.0 |
| **Bad practice** | 176 | 190 | 70.4 | 76.0 |

The distribution of level of practice towards recycling activity was shown in table 4.5. Majority of respondent from both area which urban 176 (70.4) and rural 190 (76.0) were following bad practice.

## 4.6 Compare Knowledge, Attitude and Practice on Recycling Activity between Urban and Rural Schools

Table 4.6, 4.7, 4.8 show the difference in knowledge, attitude and practice' score between urban and rural school.

The p- value of knowledge score for the Levene's test for equality of variance was 0.797. Since the p- value was more than 0.05, equality of variance was assumed. Hence, the independent T- test must be used. The p – value of the test was less than 0.05. Thus, there was different in mean knowledge score between urban and rural areas. The mean of knowledge among urban school was higher compared to rural school. The 95 % confident for mean difference was between 0.06 and 0.63. Null hypothesis accepted where there was significant different on knowledge's score between urban and rural school.

The p- value of attitude score for the Levene's test for equality of variance was 0.040. Since the p – value was less 0.05, equality of variance assumption was not met. Hence a non – parametric test based on ranking must be used. The mean rank for urban school was 246.95, while the mean rank rural school was 254.05. Based on the Mann- Whitney U test, the p – value was more than 0.05. Hence, there was not significant in attitude score between urban and rural schools. Null hypothesis rejected where there was no significant different on attitude's score between urban and rural school.

The p- value of practice score for the Levene's test for equality of variance was 0.78. Since the p- value was more than 0.05, equality of variance was assumed. Hence, the independent T – test must be used. The p – value of the test was less than 0.05. Thus, there was different in mean practice score between urban and rural schools. The mean of practice among urban school was higher compared to rural school. The 95% confident for the mean difference was between 0.012 and 0.560. Null hypothesis accepted where there was significant different on practice's score between urban and rural school.

**Table 4.6: Compare the knowledge of recycling activity between urban and rural school (N=500)**

| | GROUP | N | Mean | Std. Deviation | Sig (2-tailed) |
|---|---|---|---|---|---|
| Score Knowledge | Urban area | 250 | 7.12 | 1.608 | **0.018*** |
| | Rural area | 250 | 6.77 | 1.623 | |

N=500, independent T-test, *significant at $p < 0.05$

**Table 4.7: Compare the attitude of recycling activity between urban and rural school (N=500)**

| | GROUP | N | Mean Rank | Sum of Ranks | Sig (2-tailed) |
|---|---|---|---|---|---|
| Score Attitude | Urban area | 250 | 246.95 | 61737.00 | 0.581 |
| | Rural area | 250 | 254.05 | 63513.00 | |

N=500

**Table 4.8: Compare the practice of recycling activity between urban and rural school (N=500)**

| | GROUP | N | Mean | Std. Deviation | Sig (2-tailed) |
|---|---|---|---|---|---|
| **Score practice** | Urban area | 250 | 5.07 | 2.367 | **0.012*** |
| | Rural area | 250 | 4.51 | 2.570 | |

N=500, independent T-test, *significant at $p < 0.05$

## 4.7 Association between Social Demographic with Student's Knowledge, Attitude and Practice

The association between gender and age with student's knowledge, attitude and practice was analysed using Chi- square test and presented in table 4.9, 4.10 and 4.11 below.

There was no an association between gender with student's attitude. However, the age shows the association with attitude level. Table 4.10 show the association between age and attitude level. More than 16.2 % of student at age 17 has good attitude compared to others. The Person's Chi – square statistic was 0.018 and the degree of freedom was 8. The p – value of the test was less than 0.05. The

minimum expected count was 10.10 more than 5. Thus, there was an association between age and level of attitude. Among students at age 17 have better attitudes compare to age 13, 14, 15 and 16.

For practice, there was no an association on gender between practice levels. However, there was an association show between age and students' practice. Table 4.11 show the association between age and practice level. More than 49 % of students at age 17 have good practice on recycling compare to others. The Pearson's Chi- square statistic was 0.00 and the degree of freedom was 4. The p- value of the test was less than 0.001. The minimum expected count was 26.53 more than 5. Thus, there was an association between age and level of practice. Among students at age 17 have good practice compare to age 13, 14, 15 and 16.

**Table 4.9: Association between socio- demographic factor with attitude (N=500)**

| | | LEVEL OF ATTITUDE | | | |
|---|---|---|---|---|---|
| | | Good level | Moderate level | Low level | p-value |
| **Age** | 13 | 9 (8.9%) | 76 (75.2%) | 16 (15.8 %) | **0.018*** |
| | 14 | 10 (10.0%) | 73 (73.0%) | 17 (17.0 %) | |
| | 15 | 11 (11.0%) | 83 (83.0%) | 6 (6.0%) | |
| | 16 | 5 (5.0%) | 88 (88.0%) | 7 (7.0%) | |
| | 17 | 16 (16.2%) | 68 (68.7%) | 15 (15.2%) | |

N= 500, Chi- square test * significant at p<0.05

**Table 4.10: Association between socio- demographic factor with practice (N=500)**

| | | LEVEL OF PRACTICE | | |
|---|---|---|---|---|
| | | Good practice | Moderate level | p-value |
| **Age** | 13 | 22 (21.8%) | 79 (78.2%) | **0.000*** |
| | 14 | 17 (17.0%) | 83 (83.0%) | |
| | 15 | 30 (30.0%) | 70 (70.0%) | |
| | 16 | 17 (17.0%) | 83 (83.0%) | |
| | 17 | 48 (48.5%) | 51 (51.5 %) | |

N= 500, Chi- square test * significant at p<0.001

## 4.8 Association between Knowledge, Attitude on Practice of Recycling Activity

Chi – Square test was used to analyse the association between knowledge and attitude on practice of recycling and was presented in table 4.12 and 4.13 below.

More than 60 % have moderate knowledge with poor practice of recycle. The Person's Chi- square statistic was 0.000 and the degree of freedom is 2. The p- value of test was less than 0.001. The minimum expected count was 9.38, which was more than 5. Table 4.12 shows an association between knowledge and practice of recycling. Students with low knowledge tend to have poor practice on recycling activity.

About 59.4 % have moderate attitude with poor practice of recycling. The Person's Chi – square statistic was 0.000 and the degree of freedom was 2. The p-value of test was less than 0.001. The minimum expected count was 13.67, which was more than 5. There was an association between attitude and practice of recycling that presented on table 4.13. Students with moderate attitude tend to have poor practice on recycling activity.

**Table 4.11: Association between knowledge and practice**

| | | Practice level | | | |
|---|---|---|---|---|---|
| | | Count | Good practice | Poor practice | p-value |
| **Knowledge** | | | | | |
| | Good | 79 | 41 | 38 | **0.000*** |
| | Moderate | 386 | 87 | 299 | |
| | Poor | 35 | 6 | 29 | |

N= 500, Chi- square test * significant at p<0.001

**Table 4.12: Association between attitude and practice**

| | | Practice level | | | |
|---|---|---|---|---|---|
| | | Count | Good practice | Poor practice | p-value |
| **Attitude** | | | | | |
| | Good | 51 | 25 | 26 | **0.000*** |
| | Moderate | 388 | 91 | 297 | |
| | Poor | 43 | 18 | 43 | |

N= 500, Chi- square test * significant at p<0.001

# CHAPTER 5

# DISCUSSIONS, CONLUSION AND RECOMMENDATION

## 5.1 Discussion

This study was a cross sectional study to explore the knowledge, attitude and practice of recycling activity among secondary school students that located at urban and rural area using self – administered questionnaire.

### 5.1.1 Respondent Background

A total 500 respondents were chosen from two locations of schools in Hulu Langat, Selangor. Survey was conducted in the urban and rural school at Kajang and

Semenyih, The respondents consisted of 242 females and 258 males. More males were involved in this study because the higher number of male in both of schools.

Secondary school students were chosen to participate in this study because they had already undergone formal environmental education at both primary and secondary school education levels (Shahariah et al., 2012). The respondents had an age range from 13 to 17 and for the family income, most of their family had income of between RM 500-RM 3700. The selections of students were the person who able to read and write which could reduce the bias.

### 5.1.2 Students level on Knowledge, Attitude and Practice

Recycling knowledge is vital for youth to adopt the practice of recycling. Without sufficient knowledge (ideas and skills), they cannot perform the recommendation task to practise recycling.

In present survey, we found that 96.4 % of secondary school students had knowledge on recycle whereas 3.6 % of them had no knowledge about recycling activity. Survey showed a mean score 7.02 (out of total 10) with standard deviation

of 1.55, showing of majority of respondents had knowledge level below 80 % which was considered as moderate level.

People may know, hear or read more general information related to recycling programmes. Unfortunately, they may have little exposure to information on specific recycling. Therefore, their level of knowledge on specific recycling is slightly moderate. Thus, knowledge is a precondition for environmental awareness to ignite in individual especially in students' ability to understand and evaluate the impact of a society on the ecosystem (Gambro *et al.,* 1996). Specific knowledge can further strengthen their attitudes and their environment- friendly practice (Awang *et al.,* 2013).

The attitude toward recycling activity is important determinant of practicing the waste management. Regarding attitude on recycle, the present study found 88% of subject with high and moderate level attitude had poor recycling practice. Without knowledge, attitude alone cannot bring good behaviour and practice toward waste management. Oweini and Houri (2006) argue that, although attitude is requisites for positive action, attitude alone may not push an individual into action.

Changing youth attitude is a challenging task because youth attitude is formed and accumulated throughout the upbringing process and depends on what they believe about and what value they attach to recycling programme (Awang *et al.,* 2013). Therefore, the message of the programme must include the element of emotions. It is important to let people feel involved and associated with their interest so that the chances of they altering their attitude are greater.

Success or failure of recycling programme depends on the practice. The higher the level of practice, the greater the success achieved. In this study, the recycling practice among secondary school students was bad as out of 500 respondents, 73 % demonstrated a bad practice level on participation in recycling. It is highly probable that the failure of nationwide recycle campaigns is related to bad participation (Awang *et al.,* 2013).

Though the level of knowledge and attitude of recycling was relatively moderate in secondary school in Hulu Langat, there are still different in mean for knowledge and attitude between urban and rural school. Students were found to access knowledge from a variety of sources. Knowledge will impact students self-learning, managing behaviour, situation awareness and decision making (Lorenz *et al.,* 2005). Thus, knowledge's about recycling can aware students about the impact of increase of waste on the environment.

### 5.1.3 The Difference of Knowledge, Attitude and Practice' score between 2 Locations of Schools.

Both types of schools in urban and rural area usually have a good infrastructure and facilities. However, those in urban area have cooperation with various organizations. This cooperation will benefit the students' development in term of knowledge and skills in doing practical activity on the waste management.

Between urban and rural school, there was significant different on knowledge and practice, however there was no significant of attitude between both urban and rural school. It shows that mean of knowledge and practice among urban school was higher compare to rural school.

This might be due to the difference of their personality, influenced by their lifestyle and family (Zarritaj *et al.,* 2013). It also might be depending on teacher's knowledge about the environment and how they deliver the information to the students (Loon, 2004).

Based on study done by Nooraida *et al.,* (2012), students in urban schools already have been exposed to variety technique of waste management. However, limited activity done at rural schools. Students in rural schools should be given the same opportunities as those in urban schools. They should not be marginalized in the acquisition of knowledge related to waste management.

### 5.1.4 The Association of Socio Demographic Characteristic with Knowledge, Attitude and Practice' level

A number of factors have been shown to be determinants of environmentally friendly behaviour such as recycling (Alwitt *et al.,* 1996). From Yung (2010) research show that, socio-demographic factor such as education level and gender do not hold any relevancy in determining waste recycling behaviour.

From this study, age was the only factor influencing solid waste management in both schools at Hulu Langat. Age of 17 was showed a group that more likely to have good attitude and good practice. It was demonstrated in the majority of studies that older age likely to recycle (Singhirunnusorn, 2012).

Thus, it show that the social demographic did not help much in finding the factor that influence the respondents' knowledge and attitude towards practice of recycling activity and it agrees with Oskamp *et al.,* (2009) who found that most demographic variables did not predict participation in recycling.

### 5.1.5 The Association of between Knowledge- Attitude levels with Practice level

However there was significant association found between knowledge-attitude levels with practice level. Students with moderate knowledge and moderate attitude tend to have poor practice on recycling activity.

According to Awang *et al.,* (2013), it indicates that the recycling knowledge and recycling attitudes had a direct influence on their recycling practice. In order to improve recycling practice among secondary school students, their specific recycling knowledge needs further improvement. At the same time, their attitude towards recycling must be strengthened as well to ensure that recycling become permanent practice at the workplace and at home. Since upbringing is crucial to attitude formation, more recycling activities should be introduced to school children so that early exposure to recycling will establish and environment- friendly culture in Malaysia.

## 5.2 Conclusion

Generally, this study indicated that the level of recycling knowledge and attitude among secondary school are moderate. However, the recycling practice among them was low. However, they still realise on recycling program that have been done and most of them known about recycling programme which is "no plastic bag on Saturday in Selangor". Thus, necessary steps are required to produce a better outcome.

The study conclude that, attitude and practice between rural and urban school showed significant different on knowledge and practice. The mean of knowledge and mean of practice among urban school was higher compared to rural school. However for attitude there was a significant difference between both school areas. Meanwhile, for attitude there was no significant difference between both school areas.

Recycling is important to be predicted in our daily life. There should be no excuse such as 'did not know about it' or low attitude towards recycling as there are many resource available and easy to access. Malaysia public should also realize that solid waste is our problem not just the burden to the agencies or government.

If the individual has knowledge and is aware of the importance of recycling, but takes no action, the initiative will not succeed. The movement of individuals toward positive attitudes and behaviour regarding sustainable practices can affect the success of recycling activities. It is important to focus on high school students because adolescents are still impressionable and with proper education, they can strength their knowledge on recycling activity.

## 5.3 Recommendation

The schools should provide access over facilities and information relating to the environment, for example regarding recycling activity in order to enhance the environmental references and subjects in school libraries. These materials may attract the interest of students and teachers to learn and consequently to teach the environmental topics efficiently like global warming, waste management, ozone depletion, acid rain, greenhouse gases effect and impact resulting from environmental problems. Schools also can nurture and educate students to practice recycling activities through recycle bins with separate colour of bin for specific materials to be recycled.

The media should also play its role in raising public interest in recycling, especially among secondary school students. They could produce interesting advertisements on recycling such as by using cartoons or artists to promote recycling in the country.

Not to forget, the family plays an important role to educate the children or teenager at home. Parenting is the examples of role model to nurture good behaviour regarding environmental conservation and preservation.

## REFERENCE


Adeolu, A. T., Enesi, D. O., & Adeolu, M. O. (2014). Assessment of Secondary School Students ' Knowledge , Attitude and Practice towards Waste Management in Ibadan , Oyo State , Nigeria. *Journal of Research in Environmental Science and Toxicology, 3*(5):66–73.

Agamuthu, P., Khidzir, K.M., & Hamid, F.S. (2009). Drivers of sustainable waste management in Asia. *Waste Management & Research : The Journal of the International Solid Wastes and Public Cleansing Association, 27*:625–633.

Ajit, P., S., R. (2010). *Knowledge, Attitude and Practice on Disposal of Sharp Waste, used for Home Management of type-2 Diabete Mellitus in New Delhi, India.* Unpublished degree of master of public health program in public health, Chulalongkorn University.

Alhumoud, J. M. (2005). Municipal solid waste recycling in the Gulf Co-operation Council states. *Resources, Conservation and Recycling*, *45*:42–158.

Alwitt, L., and Pitts, R. E. (1996). Predicting pruchase intentions for an environmentally sensitive product. *Journal of Consumer Psychology,* 5:49-64.

Asmuni, S., Khalili, J.M., & Zain, Z.M. (2012). Sustainable Consumption Practices of Students in an Urban Setting: A Case in Selangor. *Procedia - Social and Behavioral Sciences*, *36*:716–722.

Awang, T, B., Salleh, Hj.Hassan., Jusang, B., Ramdzani, A. (2013). Exploring the Level of Knowledge, Attitudes and Environment- Friendly Practices Among Young Civil Servants in Malaysia. *Social Science and Humanities,* 21: 21-38.

Aziz, S. Q., Aziz, H. A., Yusoff, M. S., Bashir, M. J .K., & Umar, M. (2010). Leachate characterization in semi-aerobic and anaerobic sanitary landfills: A comparative study. *Journal of Environmental Management*, *91*:2608–2614.

Banga, M. (2013). Household Knowledge , Attitudes and Practices in Solid Waste Segregation and Recycling : The Case of Urban Kampala Recycling : The Case of Urban Kampala. *Journal of Social Science 2*(1):27-33.

Bakri, B.I. (2003). *The Regulation of Waste Management: UK's Experience Malaysia's Relevamcy.* Lilian Bloodwotrh Sheffield, United Kingdom.

Balqis, H.(2009). *Household recycling in Pandan Indah*. Unpublished master' thesis, Faculty of Engineering Universiti Technologi Malaysia, Skudai.

Bao, R. (2011). *Waste and Recycling Attitudes and Behavior of Students in Turku.* Unpublished master' thesis, University of Turku, Finland.

Batool, S. A., Chaudhry, N., Majeed, K. (2008). Economic Potential of Recycling Business in Lahore, Pakistan. *Waste Management,* 28:294-298.

Benton Jr. R. (1994). Environmental Knowledge and Attitude and Behaviour of Undergraduate Business Studies Compared to Non- Business Students. Business and Society, 33(2):191-211

Bryman, A. and Cramer, D. (2005). *Quantitative data analysis with SPSS 12 and 13: A guide for social scientist.* Routledge, London.

Budhiarta, I., Siwar, C., & Basri, H. (2012). Current Status of Municipal Solid Waste Generation in Malaysia. *International Journal on Advanced Science Engineering Information Technology*, *2*:16–21.

Busteed, M., Palkhiwala, K., Roma, M. (2009). An interactive Qualify Project Report: *Recycling Attitudes and Behaviors of Students At Carlos Pascua Zuniga high school.* Unpublished degree's thesis of Bachelor of Science, Worcester Polytheching Institute, Spanish.

Catin, J., Wang, Y. (2013). Recycling gone bad: When the option to recycle increases resources consumption. *Journal of Consumer Psychology*, 23(1):122-127

Consumer Association of Penang (CAP) (2010). *Sampah.*34 (1):14-30.

DEFRA. Survey of public attitudes abd behaviors towards the environment. http://www.defra.gov.uk/environment/statistic/waste/index.htm/-(accessed 2014).

Ebreo, A., Hershey, J., & Vining, J. (1999). Reducing solid waste: Linking recycle to environmentally responsible consumerism. *Environment and Behaviour,* 31(1):107-135.

Ekere, W., Mugisha, J., and Drake, L. (2009). Factor influencing waste separation and utilization among households in the Lake Victoria crescent, Uganda. *Journal of Waste Management*, 29:3047-3051.

Eves, F. F., Scott, E. J., Hoppé, R., & French, D. P. (2007). Using the affective priming paradigm to explore the attitudes underlying walking behaviour. *British Journal of Health Psychology*, *12*:571–585.

Fauziah, S., & Agamuthu, P. (2012). Trends in sustainable landfilling in Malaysia, a developing country. *Waste Management & Research*, *30*:656–663.

Ferdous, T. (2013). Underpinning Thinking About Education And Development Of UNESCO And World Bank : A Case Study Of Bangladesh. *International Journal Of Scientific & Technology Research, 2*(9):2277-8616.

Franchetti, M. (2012). A Comprehensive Energy, Waste, and Pollution Prevention Case Study at a Construction Materials Manufacturing Facilit in Ohio, USA. International Journal of Environment Engineering Research, 1(2):86-96

Gambro, J.S and H.N Switzky, (1996). A National Survey of High Schools Students' Environmental Knowledge. *The Journal of Environmenal Education,* 27 (3): 28-33.

Gonzalez-Torre, B. and Adenso- Diaz, P.L. (2005). Influence of distance on the motivation and frequancy of household recycling. *International Journal Waste Management*, 5:15-23

Greene, B. A., Miller, R. B., Michael Crowson, H., Duke, B. L., & Akey, K. L. (2004). Predicting high school student's cognitive engagement and achievement: Contributions of classroom perceptions and motivation. *Contemporary Educational Psychology*, 29(4):462.

Greenwald, A., G. & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and stereotypes. *Psychological Review, 102*(1):4–27.

Hassan, Y., & Mohd. Nor, M. N. A. (2013). Understanding consumer decision making towards green electronic products. *South East Asia Journal of Contemporary Business, Economics and Law*, *2*(1):27–33.

Ichor, T., Umeh, E. U., & Duru, E. E. (2014). Microbial Contamination of Surface Water Sources in Rural Areas of Guma Local Government Area of Benue State. *Journal of Medical Science and Public Health, 2*(2):43–51.

IPCC Intergovermental Panel on Climate Change (1996). Guidelines for National Greenhouse Gas Inventories, module 6: WASTE.

Jamilah, A., & Imran, A. (2012). An investigation of environmental knowledge and environmental pratices among Malaysians. *Far East Journal of Marketing and Management*, *2*(1):27–38.

Kaiser, F. G., Wolfing Kast, S., & Fuhrer, U. (1999). Environmental attitude and ecological behaviour. *Journal of Environmental Psychology*, *19*:1–19.

Khajuria, A., Yamamoto, Y., and Morioka, T. (2010). Estimation of municipal solid waste generation and landfill area in Asian developing countries. *Journal of Environmental Biology*, 31(5): 649-654

Latif, S., Omar, M., Bidin, Y., & Awang, Z. (2013). Analyzing the Effect of Situational Factor on Recycling Behaviour in Determining the Quality of Life. *Journal of Asian Behavioral Studies*, *3*:37–46.

Lemeshow, S, Hosmer, D, W., Klar, J., Lwanga, S, K. (1990). Adequacy of sample size in health studies. World Health Organization, 239.

Loon, Y.M. (2004). *Measuring Environmental Literacy among Faculty science's students.* Unpublished Master of Environment thesis, Faculty of Environmental of science, Universiti Putra Malaysia.

Lorenz, M., Gehrke, J. D., Hammer, J., Langer, H., &Timm, I. J. (2005). Knowledge Management to Support Situation- aware Risk Management in Autonomous, Self-managing Agents. *Self – Organization and Autonomic Informatics*, 1:114-128.

Matsumoto, S. (2011). Waste seperation at home: Are Japanese municipal curbise recycling policies efficient? *Resources, Conservation and Recycling,* 55:325-334

Mahmud, S. N. D., & Osman, K. (2010). The determinants of recycling intention behavior among the Malaysian school students: An application of Theory of Planned Behaviour. *Procedia - Social and Behavioral Sciences*, *9*:119–124.

Manaf, L. A., Samah, M. A. A., & Zukki, N. I. M. (2009). Municipal solid waste management in Malaysia: Practices and challenges. *Waste Management*, *29*(11):2902–2906.

Marshall, R. E., & Farahbakhsh, K. (2013). Systems approaches to integrated solid waste management in developing countries. *Waste Management*, *33*(4):988–1003.

Martin, M., Williams, I. D., & Clark, M. (2006). Social, cultural and structural influences on household waste recycling: A case study. *Resources, Conservation and Recycling*, *48*:357–395.

Masirin, M. I. H. M., Ridzuan, M. B., Mustapha, S., & Don, R. A. (2008). An overview of landfill management and technologies : a Malaysian case study at ampar tenang. *Ecological, Economical and Social Aspects,* 1:157–165.

Md Zain, S., Basri, N. E. A., Mahmood, N. A., Basri, H., Zakaria, N., Elfithri, R., Shahudin, Z. (2012). Recycling practice to promote sustainable behavior at Universiti Campus. *Asian Social Science*, *8*(16):163–173.

Md Bakri Ishak, (2001). *The Laws Of Industrial Waste Management In Malaysia.* MLJ (4).

Minghua, Z., Xiumin, F., Rovetta, A., Qichang, H., Vicentini, F., Bingkai, L., Giusti, A. and Yi, L. (2009). Municipal solid waste management in Pudong New Area, China. *Journal of Waste Management*, 29:1227-1233.

Ministry of Housing and Local Government Selected Statistic (2010), Unit Inovasi dan Data, Bahagian Korporat, Ministry of Housing and Local Goverment Malaysia.

Moh, Y. C., & Abd Manaf, L. (2014). Overview of household solid waste recycling policy status and challenges in Malaysia. *Resources, Conservation and Recycling*, *82*:50–61.

Nooraida, Y., Norizan and Hashimah, M. (2012). Exploring Secondary School Students' Belief and Attitude About Waste Management in Northern Peninsular Malaysia. *International Journal of Global Education,* 1(1):35-45.

Ngoc, U. N., & Schnitzer, H. (2009). Sustainable solutions for solid waste management in Southeast Asian countries. *Waste Management*, *29*(6):982–1995.

Nguyen, T. Q. (2011). *Understanding Recycling and Recycling Communication in University Settings* : a Case Study At the University of East Anglia. Unpublished master' thesis, University of East Anglia.

Omran, A. (2007). Current Practice of Solid Waste Management in Malaysia and Its Disposal. *Environmental Engineering and Management Journal*, 6(4): 295-300.

Omran, A. (2008). Attitude of Malaysian on Recycling of Municipal Solid Waste: *Case Studies in the Major Towns of the East Coast and North Malaysia*. Unpublished degree of doctor of philosophy, Universiti Sains Malaysia.

Omran, A., Mahmood, A., Abdul Aziz, H., & Robinson, G. M. (2009). Investigating households attitude toward recycling of solid waste in Malaysia: A case study. *International Journal of Environmental Research*, *3*(2), 275–288.

Online Utusan. (30 October 2013). Mengurus sisa pepejal secara bijak. (Online). Available: http://www.utusan.com.my/utusan/Sains_&_Teknologi/20130930/st_01/mengurus-sisa-pepejal-secara-bijak (Accessed: 13 October 2014).

Oskamp, S., Harrington, M., Edwards, T., Sherwood, P.L., Ojuda, S.M., and Swason, D.L. (2009). Factors influencing household recycling behavior. *Environment and Behavior*, 23:494-519

Oweini, A, and Houri, A. (2006). Factor affecting environmental knowledge and attitudes among Labanese collage students. *Applied Environmental Education and Communication,* 5:95-105.

Peattie, K., Simonson, L., and Tversky, A. (1993). Reason-based choice. *Cognition,* 49:11-36.

Rabinson, W.D. 1986. The Solid Waste Handbook: A Practical Guide. John Willey, New York, USA.

Rohana, S., Yatim, M., & Arshad, M. A. (2010). Household Solid Waste Characteristics and Management in Low Cost Apartment in Petaling Jaya , Selangor. *Health and the Environmental Journal*, *1*(2):58–63.

Rohana, S., Yatim, M., & Arshad, M. A. (2010). Household Solid Waste Characteristics and Management in Low Cost Apartment in Petaling Jaya , Selangor. *Health and the Environmental Journal*, *1*(2):58–63.

Rosta, H., Lim, K, H., Fadhilah, O. (2011). Environmental Knowledge and Attitude among Students in Sabah. World Applied Science Journal.14:83-87.

Salhofer, S., & Isaac, N. a. (2002). Importance of public relations in recycling strategies: Principles and case studies. *Environmental Management*, *30*(1):68–76.

Sammut, G. (2013). Measuring Attitudes and Points of View : Social Judgment of Proposals for the Revision of Student Stipends in Higher Education. *Journal of Psychology and Society, 5*(1):54–66.

Samsudin, M., & Don, M. M. (2013). Municipal Solid Waste Management in Malaysia : Current Practices , Challenges and Prospects. *Jourrnal Technology*, *62*:95–101.

Saujauddin, M., Huda, M.S., RafiqulHouque, A.T.M (2008). Household solid waste characteristic and management in Chinttagong. *Journal of Waste Management*, 28:1688-1695.

Schultz, P. W., Oskamp, S., Mainieri, T. (1995). Who recycles and when? A review of personal and situational factors. *Journal of Environmental Psychology,* 15(2):105-121.

Selangor Times (2012, March 2): Landfill proposed for Kajang. Retrieved from http://www.selangortimes.com/index.php?section=news&permalink=201203021312 8-landfill-proposed-for-kajang.[Accessed: 13 October 2014].

Seow Ta Wee, I. S. Mat Radzuan (2010). Sikap Masyarakat Terhadap Program Kitar Semula: Kajian Kes Di Daerah Batu Pahat, Johor. *Journal of Techno-Social,* 2(1):75-86.

Shahariah, A., Jamaliah M, K., Zahariah, M, Z. (2012). Sustainable Consumption Practice of Students in an Urban Seting: A Case in Selangor. *Procedia –Social and Behavioral Sciences*, 36: 716-722.

Shah, K.L. (2000). Basics of Solid and Hazardous Waste Management Technology. New Jersey: Prentice Hall.

Sidique, S., Lupi, F., Joshi, S. (2010). The Effect of Behavior and attitudes on drop- off recycling activities. *Journal of Resources, Conservation and Recycling*, 54:163-170

Singhirunnusorn, W. (2012). Household Recycling Behaviours and Attitudes toward Waste Bank Project: Mahasarakham Municipality. *Journal of Asian Behavioural Studies,* 2(6):36-45.

Susan, A. Hall., Jay, S. Kaufman and Thomas, C, Ricketts. (2006). Defining Urban and Rural Areas in U.S. Epidemiology Studies. *Journal Urban Health,* 83(2):162-175.

Sreenivasan, J., Govindan, M., Chinnasami, M., & Kadiresu, I. (2012). Solid Waste Management in Malaysia – A Move Towards Sustainability. *Journal of intech,* 3:55–70.

Tarmudi, Z., Lazim, M.A and Osman, A.T. (2009). An overview of municipal solid waste in Malaysia. *Journal of technology*, 51:1-15

Tchobanoglous, George, Theisen, Hilary & A. Vigil, Samuel (1993). *Integreted Solid Waste Management: Engineering Principles And Management Issues*, McGraw-Hill International Edition.

Thang, S. M. (2006). Malaysian Students ' Perceptions of the Environment Contents in Their English Language Classes. *Electronic Journal of Foreign Language Teaching, 3*(2):190–208.

Tonglet, M., Phillips, P. S., & Bates, M. P. (2004). Determining the drivers for householder pro-environmental behaviour: Waste minimisation compared to recycling. *Resources, Conservation and Recycling*, *42*:27–48.

Towns, S. (2014). Municipal Solid Waste Management and Characterization in Aksum and Shire- Endaslassie Town, North Ethiopia. *Journal of Environment and Earth Science 4*(13):81–88.

UNEP (2005). E- waste, the Hidden Side of IT equipment's Manufacturing and Use Environmental Alert Bulletin.
Retrieved http://www.grig.unep.ch/product/publication/download/ew_ewaste.en.pdf

USEPA (2008). Decision maker's guide to solid waste management. *Solid and Hazardous Waste Management.*

Werner, C.M., Makela, E. (1998). Motivations and behaviors that support recycling. *Journal of Environment Psychology,* 18:373-386.

Wilcox, M. A. (2014). *A study of college student attitudes and behaviors related to recycling.* Unpublished degree's thesis for degree doctor of industrial technology, University of Northern Iowa.

World Bank (2005). Urban Solid Waste Management. *Scientific Research paper.*

Yakob, N., Esa, N., & Yunus, H. M. (2012). Exploring secondary school students' belief and attitude about waste management in northern peninsular malaysia, 1(1):35–46.

Yung, Y. (2010). Domestic waste recycling, collectibe action and economic inecntive: The case in Hong Kong. *Waste Management,* 30:2440-2447.

Zarrintaj, A., Sharifah, Z., S. Z., Samad, A., H., and Mahyar, S. (2013). Relationship Between Awareness, Knowledge and Attitude Towards Environmental Education Among Secondary School Students in Malaysia. *World Applied Sciences Journal,* 22(9): 1326-1333.

Zahari, N. (2012). Investigating the Determinants of Recycling Behaviour among Secondary School Students. Unpublished degree's thesis for degree Master of Business Administration, Universiti Sains Malaysia.

Zen, I. S., Noor, Z. Z., & Yusuf, R. O. (2014). The profiles of household solid waste recyclers and non-recyclers in Kuala Lumpur, Malaysia. *Habitat International*, *42*:83–89.

Zia, H., & Devadas, V. (2008). Urban solid waste management in Kanpur: Opportunities and perspectives. *Habitat International*, *32*:58–73.

Zurbrügg, C. (2003). Urban Solid Waste Management in Low-Income Countries of Asia: How to Cope with the Garbage Crisis. *Urban Solid Waste Management Review Session, Durban, South Africa, November 2002*, (February), 1–13.

Zurmuhlen, S. (2010). *Colgate Recycling Project.*Unpublised master's thesis, University of Colagate, United State.

APPENDICES

JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM
SERDANG,

## FORM B1: RESPONDENT'S INFORMATION SHEET AND CONSENT

Please read the following information carefully, do not hesitate to discuss any questions you may have with your researcher.

1. STUDY TITLE:

**Knowledge, Attitude and Practice towards recycle among secondary school students at Hulu Langat, Selangor.**

2. INTRODUCTION

Development and the increasing population results in the decline of natural resources are to be enjoyed and used by our generation. A recycling programme is one of the strategies implemented to avoid the risk on increasing number of domestic waste at national dumping sites. These efforts were also aimed at the public to increase their participation in recycling programs. However, most Malaysians do not take part in recycling program. Thus, most wastes end up in landfills and thus worsened by fact that most landfills in Malaysia are open dumps (Abdul- Talib, 2004; Mahmood, 2000).

3. WHAT WILL YOU HAVE TO DO?

You will be interview and required to answer a questionnaire. You are needed to sign a consent form (respondent), to indicate your interest in this study. Besides that, you need to return the consent form to investigator when answer the questionnaire.

4. WHO SHOULD NOT ENTER THE STUDY?

Subjects who do not meet the inclusive criteria of this study should not enter this study. The inclusive criteria of this study are those students who unable to read or write and form 6 students.

WHAT WILL BE BENEFITS OF THE STUDY?

a) To you as the subject?

This study will give you the information on the recycle activity. This include on the knowledge about the recycle program and how you attitude on the recyclable material. Besides that, the finding of this research will help to know how student practice towards the recycle activity.

b) To the investigator

This study will help investigator to determine the knowledge, attitude and practice of the recycle activity among the secondary student at different location of schools (rural and urban area). The investigator can compare whether there is any different toward recycle practice between these two locations of schools.

5. WHAT ARE THERE POSSIBLE RISKS?

No, this study does not have any risk to subjects

6. WILL THE INFORMATION AND MY IDENTITY REMAIN CONFIDENTIAL?

Yes, all the information gathered from you will be treated very confidentially and will be known by investigator study.

7. WHO SHOULD I CONTACT IF I HAVE ADDITIONAL QUESTIONNAIRE DURING THE COURSE OF THE RESEARCH?

PROF. DR. HALIZA ABDUL RAHMAN (0122111129) – Supervisor

NUR ATIQAH BINTI YAZIZ (0174907047) – Researcher

8. CONSENT

I .....Identity Card No .....

Address.....

..... hereby voluntarily agree that my relative to take part in the research.

I have been informed about the nature of the clinical research in terms of methodology, possible adverse effects and complication (referred to information sheet). I understand that my relative have the right to withdraw from this clinical research at any time without assigning any reason whatsoever. I also understand that this study is confidential and all information provided with regards to my relative identity will remain private and confidential.

I wish to known/ don't wish to know the result of the test performed on my relative sample.

I agree/ do not wish agree that the images / photos / video recordings / voice recordings related to me be used in any form of publication presentation.

Signature..... Signature.....

(Respondent) (Witness)

Date..... Name .....

I/C No. .....

I confirm that I have explained to the respondent's parent/ guardian the nature and purpose of the above – mentioned research.

Date..... Signature .....

(Researcher)

**TAHAP PENGETAHUAN, SIKAP DAN AMALAN MENGENAI KITAR SEMULA DI KALANGAN PELAJAR SEKOLAH MENENGAH DI DAERAH HULU LANGAT, SELANGOR**

Tujuan borang soal selidik ini adalah untuk mendapatkan pendapat maklumat daripada anda berkaitan tahap pengetahuan, sikap dan amalan mengenai kitar semula di kalangan pelajar sekolah menengah. Jawapan anda akan diproses menggunakan komputer dan dikendalikan secara rahsia. Tiada hasil jawapan individu akan dibentangkan dalam apa-apa jua jenis pembentangan. Walaupun kami ingin anda untuk menjawab setiap soalan, anda mempunyai hak untuk tidak menjawab salah satu soalan, sekumpulan soalan, atau pun seluruh borang soal selidik ini. Oleh yang demikian, saya memohon jasa baik pihak tuan untuk menjawab soalan-soalan yang terdapat dalam borang soal selidik ini secara tepat dan jujur. Segala maklumat kajian yang diterima akan dirahsiakan. Kerjasama dari pihak tuan amatlah dihargai.

| | |
|---|---|
| Saya telah membaca pengenalan borang soal selidik dan bersetuju untuk menjawab mengikuti syarat-syarat yang telah ditetapkan | Ya / Tidak |

Tarikh :

Tandatangan :

.....

**Sulit**

Semua maklumat adalah untuk kegunaan kajian sahaja dan maklumat ini akan dianggap sulit. Maklumat anda hanya untuk kegunaan membahagi responden mengikut kategori yang sama.

Arahan: Sila jawab semua soalan pada bahagian yang disediakan dan tandakan (√) pada soalan yang berkenaan.

**A. MAKLUMAT RESPONDEN**

1. Umur: _____
2. Jantina:
   Lelaki ☐ Perempuan ☐
3. Bangsa:
   Melayu ☐ Cina ☐ India ☐
4. Pendapatan keluarga:_____
5. Jumlah ahli keluarga:_____

**B. SOALAN UMUM**

1. Adakah anda pernah mendengar mengenai pengasingan sampah atau aktiviti kitar semula?
   Ya ☐ Tidak ☐
2. Adakah anda menyedari tentang program kitar semula yang sedang dijalankan?
   Ya ☐ Tidak ☐
3. Daripada manakah maklumat yang anda perolehi mengenai pengasingan sampah atau aktiviti kitar semula?
   Televisyen ☐
   Radio ☐
   Majalah ☐
   Rakan ☐
   Guru ☐
   Lain- lain: Nyatakan.....
4. Adakah anda mengetahui "Hari Tanpa Beg Plastik" pada setiap hari sabtu di Selangor?
   Ya ☐ Tidak ☐
5. Berapakah bilangan tong sampah di rumah anda?
   1-2 ☐ >3 ☐
6. Kekerapan pihak berkuasa tempatan mengutip sampah di kawasan rumah anda?
   Setiap hari ☐
   Sekali seminggu ☐
   Dua kali seminggu ☐
   Tidak penah ☐

## C. TAHAP PENGETAHUAN, SIKAP DAN AMALAN

### a) Tahap pengetahuan terhadap aktiviti kitar semula

| | Kenyataan | Ya | Tidak |
|---|---|---|---|
| 1 | Adakah anda tahu lokasi pusat kitar semula yang berdekatan lokasi rumah anda? | | |
| 2 | Adakah anda tahu bagaimana cara untuk membuat pengasingan sampah? | | |
| 3 | Adakah anda tahu lokasi pelupusan sampah di kawasan tempat tinggal anda? | | |
| 4 | Adakah anda percaya kitar semula dapat memberi manfaat kepada alam sekitar? | | |
| 5 | Adakah kitar semula dapat mengurangkan jumlah sampah di tempat pelupusan sampah? | | |
| 6 | Adakah peningkatan tapak pelupusan sampah dapat mengundang pencemaran air dan udara? | | |
| 7 | Adakah anda tahu, pengurusan sisa sampah yang tidak selamat boleh mengundang kepada beberapa masalah seperti asma, demam denggi dan masalah kulit? | | |
| 8 | Adakah anda tahu warna- warna bagi tong sampah kitar semula? | | |
| 9 | Jika soalan 8, Ya<br>I. Tong sampah kitar semula berwarna biru mewakili kertas.<br>II. Tong sampah kitar semula berwarna coklat mewakili kaca<br>III. Tong sampah kitar semula berwarna jingga mewakili tin aluminium, keluli dan plastik | | |
| 10. | Adakah anda tahu, tapak pelupusan sampah yang tidak sempurna dapat mengeluarkan gas 'methane' yang mengundang bahaya kepada manusia? | | |

### b) Sikap terhadap aktiviti kitar semula

| No | Kenyataan | Pilihan jawapan | | | | |
|---|---|---|---|---|---|---|
| 1 | Jumlah sampah di rumah saya dalam kuatiti yang sedikit dan tidak memberi apa- apa kebimbangan kepada saya. | 1 | 2 | 3 | 4 | 5 |
| 2 | Pengurusan sampah adalah tanggungjawab pihak berkuasa tempatan bukan daripada diri saya sendiri. | | | | | |
| 3 | Saya ingin meluangkan masa melakukan aktiviti kitar semula di rumah sekurang- kurangnya sekali seminggu. | | | | | |
| 4 | Saya percaya kitar semula dapat membantu melindungi alam sekitar daripada tercemar. | | | | | |
| 5 | Saya merasakan aktiviti kitar semula sangat penting kepada masyarakat. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | Saya akan berasa kecewa jika saya tidak melakukan ativiti kitar semula. | | | | | |
| 7 | Saya merasakan aktiviti kitar semula akan membebankan lagi kerja saya di rumah. | | | | | |
| 8 | Ahli keluarga saya menggalakkan saya menjalankan aktiviti kitar semula. | | | | | |
| 9 | Saya percaya promosi kitar semula melalui iklan TV membantu saya memperolehi lebih maklumat. | | | | | |
| 10 | Saya merasakan aktiviti kitar semula sepatutnya diajar pada peringkat sekolah. | | | | | |

**Skala 1=sangat tidak setuju, 2=tidak bersetuju, 3=tidak pasti, 4=setuju, 5=sangat setuju**

**c) Amalan terhadap aktiviti kitar semula**

| No | Kenyataan | Ya | Tidak |
|---|---|---|---|
| 1 | Saya selalu melakukan proses kitar semula. | | |
| 2 | Saya sering mendidik ahli keluarga dan sahabat untuk menjalankan aktiviti kitar semula. | | |
| 3 | Jika saya menjumpai sampah saya akan membuang sampah tersebut mengikut kategori yang ditetapkan. | | |
| 4 | Saya sering membawa bekas sendiri apabila membeli makanan ketika berada di sekolah. | | |
| 5 | Saya tidak berminat untuk melakukan aktiviti kitar semula kerana membazirkan duit saya. | | |
| 6 | Saya sering memproses lebihan makanan untuk dibuat baja. | | |
| 7 | Saya selalu menggurangkan penggunaan beg plastik sewaktu membeli belah. | | |
| 8 | Saya kurang membuat banyak pembungkusan semasa membeli belah. | | |
| 9 | Saya selalu mendapatkan maklumat mengenai topik yang relevan dengan kitar semula dan kesan terhadap alam sekitar. | | |
| 10 | Saya selalu menyertai program kitar semula. | | |

**Sekian**

**Terima Kasih kerana sudi menjawab borang soal selidik**

**Daripada Nur Atiqah, pelajar dari UPM**

*LAMPIRAN I*

Berikut adalah butir-butir pelajar dan Projek Ilmiah Tahun Akhir yang akan dijalankan seperti di bawah:

| | | | |
|---|---|---|---|
| 1. | Nama Pelajar | : | **NUR ATIQAH BINTI YAZIZ** |
| 2. | No. Matrik/ Kad Pengenalan | : | 920523-07-5362 |
| 3. | Emel | : | mizz_bowx@yahoo.com |
| 4. | No. Tel./HP | : | 017-4907047 |
| 5. | Tajuk Kajian | : | ***Knowledge, Attitude and Practice Towards Recycle Activity Among Secondary School Student at Hulu Langat, Selangor.*** |
| 6. | Tempoh Penyelidikan | : | **12/01/2015 hingga 01/03/2015** |
| 7. | Bilangan Responden Yang Diperlukan | : | 300 Pelajar dari Tingkatan 1-5 (Kelas Tahap Tinggi dan Sederhana : 60 Pelajar dari setiap tingkatan). |
| 8. | Bahan Kajian | : | Borang Soal Selidik |

UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI

**FAKULTI PERUBATAN DAN SAINS KESIHATAN**
***Faculty of Medicine and Health Sciences***

***Ruj. Kami:*** UPM/FPSK/JKPP/600-3/1/6-EOH4999A&B
***Tarikh:*** 19 Januari 2015

Pengetua
Sekolah Menengah Kebangsaan Bukit Indah
Taman Bukit Indah
68000 Ampang
**SELANGOR DARUL EHSAN**

Pengetua
Sekolah Menengah Kebangsaan Jalan Reko
Jalan 5, Seksyen 5
Bandar Baru Bangi
43000 Kajang
**SELANGOR DARUL EHSAN**

Pengetua
Sekolah Menengah Kebangsaan Bandar Rinching
Jalan 2/9A Seksyen 5
43500 Semenyih
**SELANGOR DARUL EHSAN**

Tuan/Puan,

**MEMOHON KEBENARAN MENJALANKAN PENYELIDIKAN TAHUN AKHIR KURSUS EOH4999A&B (PROJEK ILMIAH TAHUN AKHIR)**

Dengan hormatnya perkara di atas adalah dirujuk.

2. Sukacita dimaklumkan bahawa pelajar Tahun 4 program Bacelor Sains (Kesihatan Persekitaran dan Pekerjaan), Fakulti Perubatan dan Sains Kesihatan, UPM, ingin memohon kebenaran menjalankan penyelidikan Tahun Akhir di sekolah tuan/puan.

3. Tujuan Projek Ilmiah Tahun Akhir ini dijalankan adalah bagi memenuhi salah satu syarat untuk pelajar bergraduat. Bersama-sama ini dilampirkan surat kebenaran yang telah dikeluarkan oleh **Kementerian Pelajaran Malaysia (KPM) dan Jabatan Pendidikan Selangor (JPS)** serta maklumat lanjut pelajar yang akan menjalankan penyelidikan tersebut (**sila rujuk** ***LAMPIRAN I***).

4. Jika pihak tuan/puan memerlukan penerangan lebih lanjut, sila hubungi **Penyelia Projek (Profesor Madya Dr. Haliza Abdul Rahman)** Jabatan Kesihatan Persekitaran dan Pekerjaan, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor di talian: **03-89472403/** fax: **03-89472395/** emel: **dr.haliza@upm.edu.my** atau **pelajar berkenaan** seperti dilampiran.

*LAMPIRAN I*

Berikut adalah butir-butir pelajar dan Projek Ilmiah Tahun Akhir yang akan dijalankan seperti di bawah:

| | | | |
|---|---|---|---|
| 1. | Nama Pelajar | : | **NUR ATIQAH BINTI YAZIZ** |
| 2. | No. Matrik/ Kad Pengenalan | : | 920523-07-5362 |
| 3. | Emel | : | mizz_bowx@yahoo.com |
| 4. | No. Tel./HP | : | 017-4907047 |
| 5. | Tajuk Kajian | : | ***Knowledge, Attitude and Practice Towards Recycle Activity Among Secondary School Student at Hulu Langat, Selangor.*** |
| 6. | Tempoh Penyelidikan | : | **12/01/2015 hingga 01/03/2015** |
| 7. | Bilangan Responden Yang Diperlukan | : | 300 Pelajar dari Tingkatan 1-5 (Kelas Tahap Tinggi dan Sederhana : 60 Pelajar dari setiap tingkatan). |
| 8. | Bahan Kajian | : | Borang Soal Selidik |