Income Valuation of Rubbish Collectors from the Garbage Dump Sites in Kelantan, Malaysia

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ABSTRACT

Landfill is a traditional method for solid waste disposal used throughout Malaysia including Kelantan. Despite negative connotation, landfill is actually a place for many poor people earning extra income to support their living. Hence, this study aims to investigate the income earned by rubbish collectors (scavengers) from the landfill sites in Kelantan.Interviews were carried with 50 respondents based on a structured questionnaire crafted to capture the demographic characteristics, monthly income, as well as types of waste materials and volume of each waste material collected. A descriptive statistical method was used to describe demographic profiles of respondents and types and volumes of waste materials collected by respondents. Out of 50 respondents, 47 of them were locals (Malaysians), two Burmese and one Indonesian.They were 33 males and 17 females. Majority of the respondents were from the age group of 20 to 29 where 8(16%) of them were still single while 42 (84%) were married. Among the married respondents, 8(16%) of them have no children, 12(24%) have one to two children, 13(26%) have three to four children and 17(34%) have more than four children. Majority of the respondents had from primary education. There provided a few reasons of why they were involved in rubbish collecting. 17 (34%) respondents said that it was a source of income, nine (18%) respondents answered as self- employment, 21 (42%) respondents said that it was for an extra income, while, three respondents said that they took over (continued) the work from their parents. There were 29 respondents (58%) who worked around three to four hours per day, 17 respondents (34%) worked around five to six hours per day, and four respondents (8%) worked more than six hours per day. The income was correlated (P<0.05) with the number of working hours in a day. In terms of income, ten respondents earned an income of less than RM 250 (20%), 23 respondents earned between RM 251 to RM 500 (46%), ten respondents earned between RM 501 to RM 750 (20%), four respondents earned between RM 751 to RM 1000 (8%), two respondents earned between RM 1001 to RM 1250 (4%) and one respondents earned from RM1251 to RM 1500 (2%). Therefore, the scavengers were able to earn an average of RM 465.5 per month.The study also showed that, most of the scavengers collected plastic and aluminum cans, 94% of them collect metal, 92% of them collect electronic parts, 68% collect glass waste and 10% of them collect paper. The amount of plastic, metal, glass, aluminium and paper wastecollectedexceeded10 kilogram per month, except for electronic parts which was less than 10 kilogram per month.In conclusion, the income earned by scavengers was considered as high and able to pull them out of the hard core poor groups. It is hoped that through this study, the local authority will recognise rubbish collectors (scavengers) as a job for the poor to earn their livelihood and develop proper mechanism to address the issue.

INTRODUCTION

Scavenging renders economic and environmental benefits such as providing income to unemployed individuals, supplying cheaper raw materials to industries, decreasing the demand for collection, transportation and disposal of waste. In other developing countries such as Malaysia, scavenging starts with the collection of plastic bags, bottles, papers, cardboards, aluminium, iron and rubber materials, and it mostly takes place in the informal sector. Scavengers in Malaysia provide informal collection and recovering additional materials at the open dumping sites (landfill) which not only help them in earning an income but also assist to reduce the amount of solid waste to be disposed and thus reduce environmental degradation.

Recycling of waste in the developing countries is largely dependent on scavengers in recovering materials. This is done by scavengers at the dumpsites who searched for recyclables in exchange of money. Scavenging is an occupation that provides a livelihood for the poor and it is an important survival strategy in which impoverished individuals cope with scarcity. Scavengers typically specialize in recovering only one or a few types of waste materials. Scavenging takes place in all stages along the waste management system that is; source separation at household or place generating waste material; where material are reused, sold or given away for instance, old newspapers are reused for packing. Batone and Okiverira (1992) observed that during collection, scavengers segregate recyclables for sale. On the other hand, scavengers also retrieve recyclables at dumps, along the roads or public places, in canals and streams, at landfill sites prior to burial and purchase source of separated recyclables from residents. Scavenging is a prevalent occurrence throughout the developing world. World Student Community for Sustainable Development, (WSCSD, 2005) estimated that up to 2% of the population in the third world countries survive by recovering materials from waste. Scavengers sort out materials to sell for recycling, as well as for their own use. The recovery of materials from dumpsites by scavengers in developing countries takes place in the wide variety of settings. Although, the circumstances in which materials are recovered in a particular place may be unique, it is obvious as opined by Blincow (1986) that scavengers

source their materials from two major ways; either by sorting or collecting freely from dumps and landfill, or by purchasing the already sorted materials from households.

Poverty is common in most developing countries and this has forced the poor to get incomes in most of the resources available to them. Vogler (1984) stated that given the very low income in most developing countries, scavenging provides them with reusable and saleable materials. In doing so, the poor has developed creative ways in order to satisfy their needs. This is through the recovery of items which are not necessarily pail of the waste stream. In Mali, a lot of farmers search and dig artefacts produced by ancient Mali Empire in order to sell them to art collectors (Holmes, 1984). In Calcutta, scavengers work along the rail road tracks in order to recover the pieces of coal that fall from the train (Furedy, 1984). In Cairo, scavengers search ox dung for undigested kernels of corn to eat (Meyer, 1987).

MATERIALS AND METHODS

Sampling Sites

Eight landfills in Kelantan were selected for the survey. Before selecting the study site, preliminary visit was done to assess the presence of rubbish collectors. Henceforth, survey sites were selected based on the accessibility, status of the landfills whether it is active or not and also the presence of rubbish collectors.Selected landfills are located in Tanah Merah, Machang, Bachok, Tumpat, Lubok Jong, GuaMusang, Kuala Krai and Jeli in Kelantan (**Figure 1**).
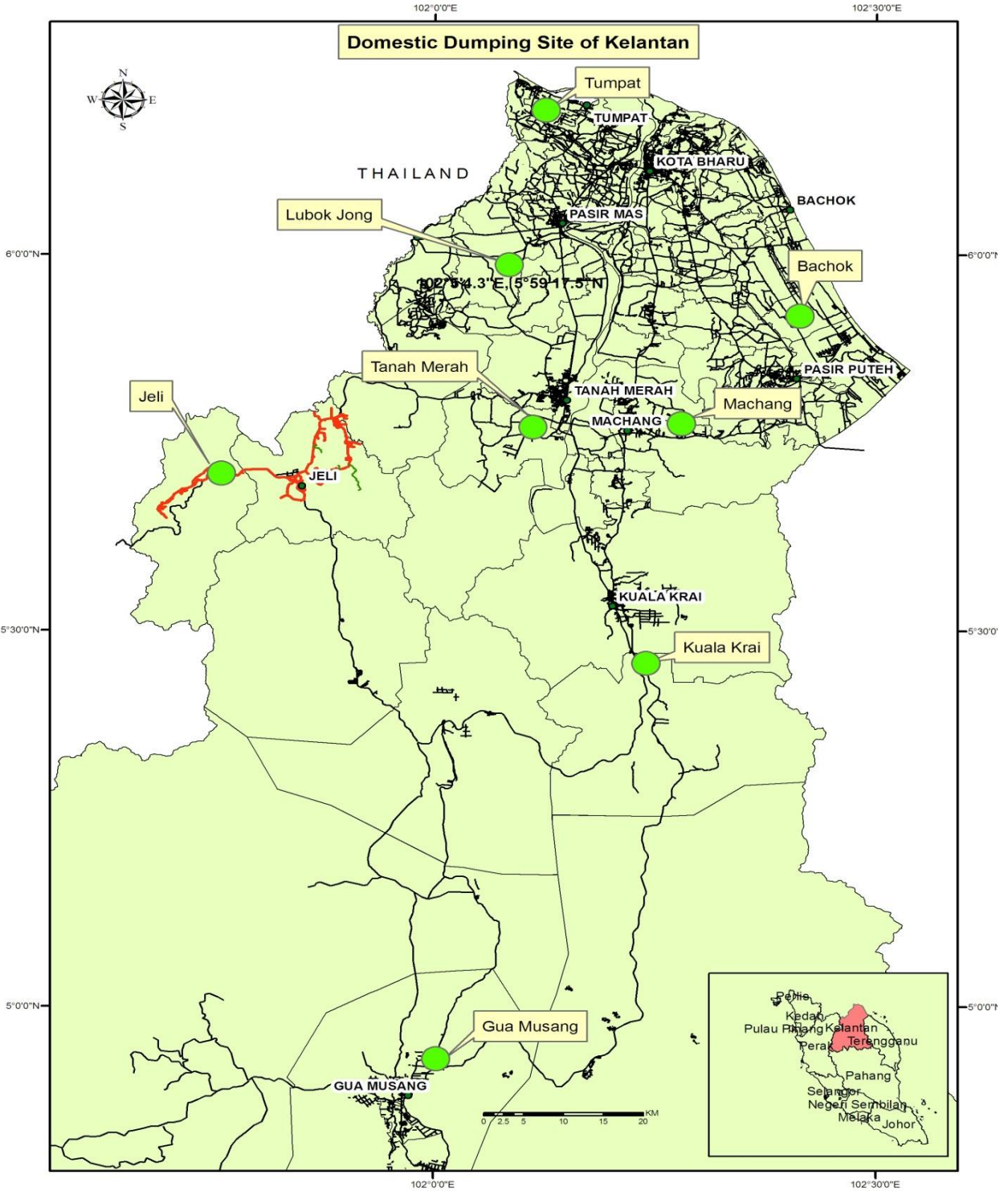
Domestic Dumping Site of Kelantan

Figure 1: Sampling Sites

Sampling and Data Analysis

A set of questionnaire was designed based on Magaji, *et al.,* (2011) which consists of four parts namely demographic profile, type of materials scavenged, quantity and volume of each material scavenged and monthly income of scavengers. Scavengers were chosen randomly from eight selected domestic waste landfills with the total of 50 respondents. The data was collected through interview with the use of prepared questionnaire. Survey was conducted during peak hour of a day which was from 8.00 a.m. until 5.00 p.m at each of the dumping sites. This was done to ensure that there was no any possibility of scavengers that were left behind from this survey.

Figure 3.2: Domestic Dumping Sites in

A descriptive statistical method based on the Statistical Package for Social Science (SPSS) version 15 and Microsoft Office Excel 2003 was used to describe demographic profile of respondents, types and volume of waste collected by respondents and income earned by them.

RESULTS AND DISCUSSION

Demographic Profile of Respondents

The demographic data of respondents such as citizenship, gender, age, number of children and level of education only involve single variable because it only has small number of categories or values. Therefore, a pie chart was used to illustrate relative frequency of the categories or values of data.

The results showed that there were 47 Malaysians, two Burmese and one Indonesian

respondent. The percentage of Malaysians was 94% and 4% for Burmese as well as 2% for Indonesian. This result indicated that, not only Malaysians who saw the potential of scavenging at the landfills as one of the income source but there were also immigrants from Burma and Indonesia. This also revealed that, landfills in Malaysia especially in Kelantan have plenty of saleable waste materials to be explored and can be turned into money.

There were 33 malerespondents and 17 femalerespondentsthat were involved in this study. In terms of percentage,the male respondents contributed 66 % of the total respondents while, femalerespondents was 34 %. Male respondents' percentage was higher than female respondents due to the nature of the job. Scavenging was quite unsanitary and the scavengers may face molestation by others(Magaji, *et al.,* 2011). Hence, females would not prefer to become scavengers due to unsanitary and un-aesthetic condition of the dumping sites. Besides that, females werenot able to collect and handle heavy wasteduring collection and selling.

Interms of age groups,there were two respondents from the age group of below 20 (4%), 15 respondents from the age group between 20 to 29 (30%), eight respondents from the age group between 30 to 39 (16%), 11 respondents from the age group between 40 to 49 (22%), ten respondents from the age group between 50 to 59 (20%) and four respondents from the age group between 60 to 69 (8%). Majority of the respondents were in the age group of 20 to 29 years old and very few were below 20 years old. Many of the respondents who were involved in waste collecting were between 20 to 29 years old. This evidence was supported by Magaji et al. (2011) where they stated that, young and energetic scavengers were able to withstand the stress of scavenging (Magaji, et al., 2011). These scavengers were also attracted and motivated by the income collected and the flexibility of this job as compared with other jobs especially in the time factor. The age group of respondents had led to another relating factor i.e. the marital status. It was found that, 8 respondents (16%) were still single while 42 respondents (84%) were married. The age of married respondents was between 20 to 59 years old. Furthermore, based on the results obtained, eight respondents (16%) had no children, 12 respondents (24%) had one to two children, 13 respondents (26%) had three to four children and 17 respondents (34%) had more than four children. From the results, it was evidently that there were only a small number of scavengers (16%) that had no children and the rest of the scavengers (84%) had at least one or more children. This showed that, rubbish collecting was one of the sources of incomefor them to support their families. This was parallel with the findings of Medina (2000) and Wilson, et al., (2006) where they reported that, up to 2% of Asian and Latin America's urban population was dependent on waste

collecting to earn their livelihood.

In terms of educational background it was shown that, 11 respondents (22%) had no formal education, 17 respondents had primary education (34%), 15 respondents had *PMR* (lower secondary- form three) qualification (30%), and seven respondents had *SPM* (secondary - form five) education (14%). Majority of the respondents were from primary education (34%). This was believed to be the reason why they chose to be scavengers because they did not have adequate academic qualification to seek for better jobs. The percentage of scavengers decreased as the academic qualification increased. This was shown in the results obtained where respondents who had *SPM* education level contributed only 14% of the total respondents.

When they were asked the reasons of getting involved in scavenging, most of them said that they did that to get extra income; 38 respondents (76 %), nine (18%) of them did it as a permanent job and three (6%) respondents were involved in rubbish collecting because they carried on or took the work from their parents. Majority of the respondents joined this scavenging for extra income. Some were rubber tappers and petrol station attendants and these were their permanent jobs. This job helped them to generate extra income to support their families. A few respondents joined this scavenging because they continued from their parents. However, most of the parents nowadays would send their children to schools for better jobs in the future instead of *inheriting* rubbish collecting job from their parents.

Most of the respondents work at least three to four hours per day. The results obtained shows that, 29 respondents (58%) worked around three to four hours per day, 17 respondents (34%) worked around five to six hours per day, and four respondents (8%) worked more than six hours per day. Based on Pearson Correlation Analysis,the income was significantly correlated ($P<0.05$) with the number of working hours in a day (Table 1). It could be suggested that, respondents who worked three to four hours per day basically is part-time scavengers. On the other hand, respondents who worked five to six hours could be in to two groups which were part-time and full-time scavengers. Meanwhile, respondents who worked more than six hours per day can be categorized as full-time scavengers.

Table 1: Correlation between Working Hours per Day and Monthly Income

Correlations		MonthlyIncome	Working hoursper day
MonthlyIncome	Pearson Correlation	1	.305*
	Sig. (2-tailed)		0.031
	N	50	50
Working hoursper day	Pearson Correlation	.305*	1
	Sig. (2-tailed)	0.031	
	N	50	50
*. Correlation is significant at the 0.05 level (2-tailed).			

Monthly Income

Studies have found that when scavenging was tolerated or supported, scavengers can earn higher income than unskilled and formal sector workers (Medina, 1997). **Figure 2** showed that, there were ten respondents who earned an income of less than RM 250 (20%), 23 respondents who earned between RM 251 to RM 500 (46%), ten respondents who earned between RM 501 to RM 750 (20%), four respondents who earned between RM 751 to RM 1000 (8%), two respondents who earned between RM 1001 to RM 1250 (4%) and one respondents who earned from RM1251 to RM 1500 (2%). Majority of the respondents hada monthly income of RM 251 to RM 500 (46%) while the least number of respondents have a monthly income of RM 1251 to RM 1500 (2%). The average monthly income of the scavengers from selling collected wastes was about RM 465.50.There was only one respondent who collected rubbish at Machang landfill and earned between RM 1251 to RM 1500. This was due to very few less scavengers collecting rubbish at the said landfill and thus, there was less competition. Overallthe income of scavengers who worked at dumping sites of Machang and Jeli were higher than other dumping sites due to lesser competition.
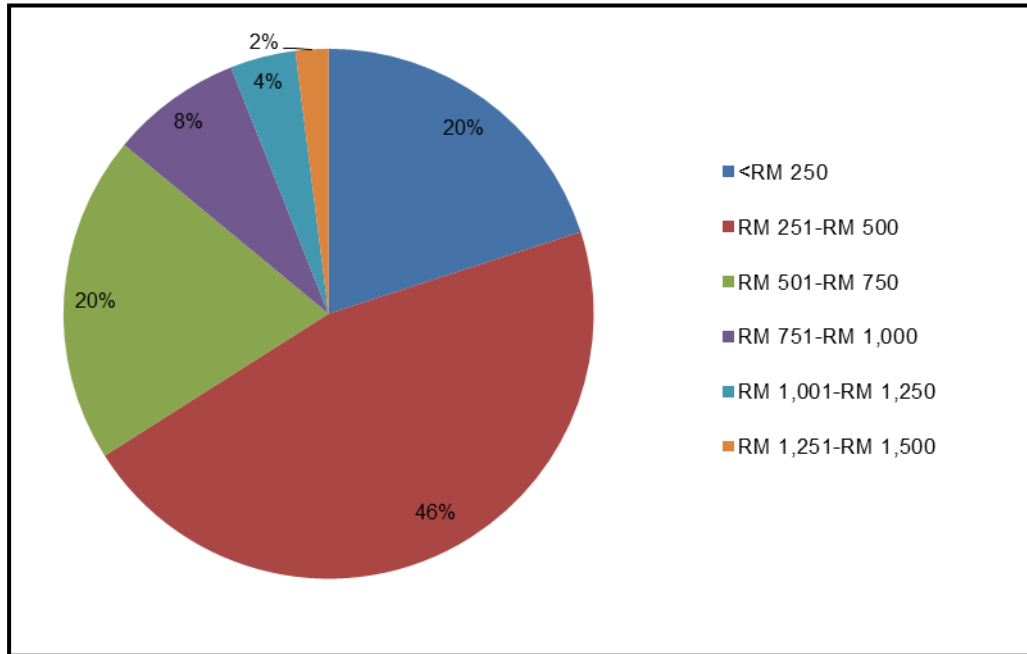
Figure 2: Monthly Income

Types and Volume of Waste Collected by Respondents

The results showed that, all the scavengers go for all the precious wastes namely plastic, aluminium, metal, electronic parts, glasses and papers. Hundred percent of the scavengers collected plastic and aluminium, 94% of them collected metal, 92% collected electronic parts, 68% collected glasses and 10% collected paper (**Figure 3**).

Plastic and aluminium were items that were collected by all of the rubbish collectors (scavengers). This was believed to be due to both the wastes can be easily found and abundant at the landfills. Plastic bottles and aluminium can drinks were consumed every day, therefore these wastes were present at the landfill in large amount. Besides that, prices of these items were also reasonable, attractive and lucrative. According to one of the respondents from this

survey, the price offered by the third party for plastic bottles was RM 0.60 per kilogram while the price for aluminium cans was RM 3.20 per kilogram.

Other waste materials collected by majority of the scavengers were metal and electronic parts. According to this survey, the price for metal was RM 0.60 per kilogram while the price for electronic parts was RM 1.60 per kilogram. Both waste materials were also popular among scavengers because of the attractive prices. However, it was difficult to findthem at open landfills. This was believed to be due to these wastematerials that were usually sorted out and sold at the homes or shops before they reached the dumping sites. Therefore, these types of waste materials could only be collected by scavengers in small quantity although they were popular among them.

Glass and paper waste materials were the least collected by most of the scavengers. This was believed to be due to these types of waste materials that were difficult to search at open landfills. Paper and cardboard usually would not enter the waste stream and if there were any, they would easily get wet due to rain. Besides that, these types of waste materials were not popular among scavengers due to low prices that they fetched. Based on this survey, the price for paper was RM 0.20 per kilogram. For glass bottles, the price was not based on measurement in weight (kilogram). It was based on numbers of glass bottles collected. According to scavengers, 100 small glass bottles could only fetch RM 2.50 while100 big glass bottles were sold at RM 5.00.
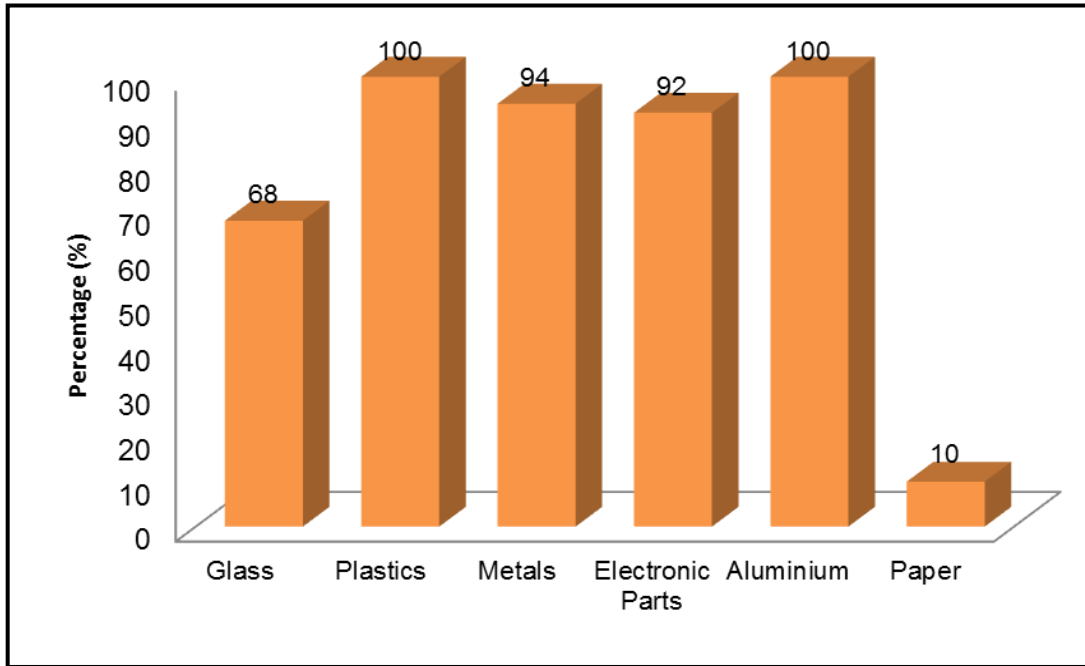
Figure 3: Types of Waste Collected

The results showed that, half of the respondents (50%) collected more than 50 kg of plastic, meanwhile 34% collected between 31-40 kg and 10% of them collected between 21-30 kg per month (**Table 2**). On the other hand, 38% of the respondents collected more than 50 kg of glass, 32% collects between 31-40 kg per month. While for the electronic parts, most of the respondents (92%) could only collectless than 10 kg waste per month. This was believed to be due to the reason that electronic parts were segregated and sold at homes or shops before they reached landfills. Thus, electronic parts were the least found in the waste stream. Most of the respondents collected more than 10 kg of metal per month, while 90% of respondents collected more than 21 kg per month of aluminium cans. On the other hand, 60% of the scavengers collected more than 50 kg paper waste. This could suggest that, paper was the most abundant waste that could be found at the open landfills in Kelantan. This wasthen followed by plastic, glass bottles, aluminium, metal and lastly, electronic parts.

Table 2: Volume of Waste Collected

Types of Waste	Composition of Waste Collected (%)					
	≤10kg	11-20kg	21-30kg	31-40kg	41-50kg	≥50kg
Glass	0	0	15	32	15	38
Plastics	0	0	10	34	6	50
Metals	2	26	32	15	4	21
Electronic Parts	91	2	2	2	0	2
Aluminium	2	8	22	30	16	22
Paper	0	20	20	0	0	60

CONCLUSION

Majority of the scavengers were males as it was due to the nature of the jobs which was unsanitary and unsuitable for women. Most of the scavengers were from age group of 21 to 29 and most of them had low educational level. About half of the respondents involved in rubbish collecting (scavenging) had one reason, which is to gain extra income to support their families. This was evidently shown when 34% of the respondents who were scavengers had more than four children. Most of them worked as a rubber tappers or petrol station attendants their full time jobs and scavenging was a part time job for them. The average monthly income of the scavengers from selling waste was about RM 465.50 and this was considered as high and able to pull them out of hard core poor groups.

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