Public Perception to Littering in Greenspaces: A Case Study in Bintulu, Sarawak, Malaysia

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Abstract. Greenspaces are central to the success of cities. However, what is normally found while walking in local parks or greenspaces are empty cans, bottles, food wrappers and other litters that ruin the aesthetic beauty of the site. Increase in the number of visitors visiting parks in Malaysia has resulted in a growing littering problem. Some parks even received numerous complaints regarding litter. In order to understand the problem of littering in parks, a study was conducted with the objective of identifying factors influencing peoples’ littering behaviour in Pantai Temasya Bintulu, Sarawak, Malaysia. A total of 178 set of questionnaires were distributed to visitors at Pantai Temasya Bintulu, Sarawak, which is a popular recreational park in Bintulu. Data collected was encoded into the Statistical Package for Social Science (SPSS) and analysed accordingly. The study found more male (61.8%) than female (38.2%) respondents have done littering in the past. While more Chinese (73.1%) respondents admitted to littering than any other races. With regards to marital status, singles (64.2%) and those without children (64.4%) top the list for littering. Respondents of the age group of 17 to 25-year-old (70.6%) recorded a high percentage for littering as compared to other age groups. Respondents with only a primary school (66.7%) education have a higher tendency to litter. Besides, jobless adults and students also dominated the chart for littering for the occupation profile. Parallel with that, the income group which those without any source of income (65.3%) was the highest to admit to littering. The study identified attitude to be the highest factor influencing littering among visitors with nearly 65% respondents agreeing to it. Meanwhile, beverage containers such as aluminium cans, glass and plastic bottles were found to be the type of litter most frequently found in Pantai Temasya Bintulu. Studies on public perception towards littering are essential for administrative and strategic planning of litter control. In the case of Pantai Temasya Bintulu, early education and awareness campaigns are seen to be the best approach to instil good attitudes among the visitors.

1. Introduction
Problem with littering in paths, parks and other public spaces has become a vast issue in our communities. Littering is unpleasant from the view of city cleanliness [1], harmful to people and animals, and contributes to horrible odour in the environment. Manning mentioned that urban greenspaces are exposed to various recreational use impact including littering [2], and this is agreed by Moore [3]. Litter includes any compact or fluid domestic or commercial refuse, wreckage or garbage. Without limiting to the generality of the above, litter includes soft drink bottles (both plastic and metal), glass, metal, cigarette butts, small pieces of paper, chip, fabric, and confectionery wrappers, fast-food packaging, bottle covers, other bottles, plastic straws, wood, food, abandoned
vehicles, abandoned vehicle parts, construction or demolition materials, garden remnants and trimmings, and soil sand or rocks generally [4]. Due to that, the littering of waste in urban and natural sceneries decreases the beautiful and ecological value of the environment [5].

Issues related littering in Malaysia have been discussed [6] and a conducted stated that Malaysia generated 5.4 million tonnes of local and commercial waste exclusive of toxic solid, explaining into 13,500 tonnes per day, and nonstop increasing with the growing inhabitants. Each person contributed an estimation of 1.7 kg of waste daily in major cities in Malaysia. Due to this, Malaysia should look seriously in addressing such matter [7]. In Singapore, the production of waste is approximately 7,670 tonnes daily and is equivalent to 1,100 truckloads or 1 football field (1.7 m high) [8]. The concern is on how to change the attitude of people who continue to throw litter and garbage uncontrollably which will increase the cost of cleaning up and transfer of litter or waste.

Most people thought that littering is widespread. It occurs wherever people are, both indoor and outdoor. Research on littering has been conducted in a range of dissimilar settings, such as camping grounds, cafés, walkways and parks [9]. Littering normally occurred during night-time when it was fuelled by drunkenness [10]. However, littering also normally occurs during mealtimes – lunch and dinner. Numerous causes have been recognized to influence littering proportions such as the lack of social pressure to inhibit littering, lack of realistic penalties or consistent prosecution, social rebellion, and lack of awareness of the effect of littering. Other reasons contain poor packaging design of commercial products, volume of litter already present at a particular site, absence of wording signs referring to litter, and the number and/or placement and appearance of waste collection bins on site [11, 12, 13, 14, 15]

Littering in the park has become a topic of concern. Most developing countries are challenged by restrictions and pressures regarding solid waste management [16], and little attention has been focusing on littering behaviour [17]. In Malaysia, the increasing number of visitors visiting parks has resulted in a growing number of littering problems [18]. Some parks received many complaints concerning litter. A trail of Telok Pandan Kecil and Telok Pandan Besar in Bako National Park, Sarawak was reported to be spoiled by the sight of rubbish consisting mainly of empty plastic bottles and soft drink cans. A study at Samajaya Forest Park found that littering was most common where facilities are sited such as car park and canteen [18]. The Crocodile and Recreation Park in Ayer Keroh Melaka recorded food containers, water bottles, plastic bags, clothing, slippers and even diapers being thrown by visitors [19]. The littering may threaten the existence of beautifying resources in Taman Negara Kuala Koh (National Park) [20]. Moreover, among reasons for coral degradation in Malaysia also through waste disposal and littering [21].

Public parks should be free of mess from litter or garbage. A scene of overloaded bins and uncollected rubbish trash created not just foul aroma but also insight. Litter even can injure people and animals. Many children in Nablus district as well as in other Palestinian districts were injured by broken glass litter [4]. The impacts of littering also to small islands especially to marine biodiversity such as coral reef and fisheries [22]. In addition, more than 50 crocodiles died from eating non-digestible materials thrown by visitors at the Crocodile and Recreation Park in Ayer Keroh Melaka [19]. Thus, it is important to identify peoples’ littering behaviour in public parks. Through the behaviour of the visitors, we can know how to keep the park clean and safe to publics. Littering is a bothersome behaviour that causes high and unnecessary costs and efforts for cleaning-up [23].
An attitude can be defined as psychological tendency to view a particular object or behaviour with a degree of favour or disfavour [24]. Typically, when we refer to an individual’s attitudes, we are trying to explain his or her behaviour. Attitudes are a complex combination of things we tend to call personality, beliefs, values, behaviours, and motivations. Attitude towards littering is an individual’s psychological tendency to evaluate or respond with a certain degree of favouritism or dis-favouritism towards the throwing of wastes on bare ground. Attitude is cognitive, affective, and normative in character [25]. Other findings proposed that the littering behaviour is influenced by an individual’s emotion, intellectual, knowledge, action, value and association with others, including the surroundings [26]. Individuals with pro-environment attitude are altruistic [27]. Meanwhile, littering is normally connected with littering behaviour and awareness [28].

Littering behaviour relates personality characteristics and responsible environment behaviour. This implies that individual who possess certain desirable personality characteristics and who has an unfavourable attitude towards littering has more tendencies to be engaged in pro-environmental behavior [29]. The negative behaviour towards littering can be linked to a decrease in family and community health, bad odour, proliferation of flies, cockroaches, rats, and other small and dangerous insects which breed ailments and endanger human health [25]. The aims of this work are to (i) identify the opinion and people littering behaviour and (ii) determine the influence of littering on visitors visiting Pantai Temasya Bintulu.

2. Materials and Methods

This study was conducted among visitors visiting Pantai Temasya Bintulu, Sarawak, which is a popular recreational park in Bintulu. It is located approximately 5km from Bintulu town covering an area of 25 acre. Bintulu has a total of 183,892 residents [30]. A structured questionnaire was used to collect data which was distributed randomly to 178 respondents visiting the park. The questionnaire was written in two languages, Malay and English, and designed to contain both close-ended and open-ended questions. The questionnaire was separated into three major parts: i) socio-demographic background of the respondent such as gender, age, marital status, education, occupation, and monthly income ii) general opinion concerning littering and iii) opinion regarding the cleanliness of Pantai Temasya Bintulu. Data collection was carried out every day (Monday to Sunday) within the month of February until April 2013. Respondents were allowed to answer the questionnaire at their own pace and the questionnaires were collected thereafter. Each respondent took approximately 10 to 15 minutes to answer all given questions. Analysis of data was performed using the Statistical Package for Social Sciences (SPSS) computer program version 11.0. Descriptive analyses were used to describe of feature the respondents littering behaviour and practices.

3. Results and Discussion

Results described on the socio-demographic background and littering behaviour (Table 1) showed more male (61.8%) than female (38.2%) respondents admitted that they have littered in the past. Similar findings regarding littering by gender has been reported in Nablus district [17] and in a wide range of outdoor public locations across the United States [31]. More Chinese (73.1%) respondents than other races such as Melanau (58.1%), Malay (54.9%) and Iban (54.8%) acknowledged that they have done littering. Singles (64.2%) have higher tendency to litter than any other marital status groups. This was also reflected in other results, where couples with no child (64.4%) recorded higher percentage of littering than couples with 1 to 2 (58.1%) and 3 to 5 (34.5%) children. In terms of age group, those of the 17 to 25-year-old age group (70.6%) was more dominant to commit littering. This is aligned to a study by Schultz et al. (2011) where younger aged group have higher probability of litter more than older aged group. Moreover, there is a significant association between litterers’ age and littering behaviour [28]. More respondents with only the primary education (66.7%) admitted of having littering than those with a secondary (54.0%), certificate (43.7%) and tertiary (64.7%) education. Jobless adults (71.4%) and students (69.4%) top the list for littering for the occupation profile. As for the income grouping, those without any source of income (65.3%) dominated the chart for littering. According to Santos et al. (2005), littering will be higher in areas occupied by people with a lower average annual income. Generally, the littering behaviour is commonly influenced by the litter profile such as gender, family income, education level and age [28].
Table 1. Socio-demographic associated with littering behaviour

| Demographic Profile | Percentage (%) and Frequency (n) | Total Percentage (%) |
|---------------------|---------------------------------|----------------------|
|                     | Yes                             | No                   |
| **Gender**          |                                 |                      |
| Male                | 61.8 (n=63)                     | 57.9 (n=44)          | 60.6 (n=109) |
| Female              | 38.2 (n=39)                     | 42.1 (n=32)          | 39.4 (n=71)  |
| **Ethnicity**       |                                 |                      |
| Malay               | 54.9 (n=45)                     | 45.1 (n=37)          | 46.1 (n=82) |
| Chinese             | 73.1 (n=19)                     | 26.9 (n=7)           | 14.6 (n=26) |
| Iban                | 54.8 (n=17)                     | 45.2 (n=14)          | 17.4 (n=31) |
| Melanau             | 58.1 (n=18)                     | 41.9 (n=13)          | 17.4 (n=31) |
| India               | 33.3 (n=2)                      | 66.7 (n=4)           | 3.4 (n=6)   |
| Others              | 50.0 (n=1)                      | 50.0 (n=1)           | 1.1 (n=2)   |
| **Marital Status**  |                                 |                      |
| Single              | 64.2 (n=61)                     | 35.8 (n=34)          | 53.4 (n=95) |
| Married             | 47.9 (n=35)                     | 52.1 (n=38)          | 41.0 (n=73) |
| Divorced            | 50.0 (n=4)                      | 50.0 (n=4)           | 4.5 (n=8)   |
| Widow               | 100.0 (n=2)                     | 0.0 (n=0)            | 1.1 (n=2)   |
| **Number of Children** |                               |                      |
| 0                   | 64.4 (n=65)                     | 35.6 (n=36)          | 56.7 (n=101) |
| 1 to 2              | 58.1 (n=25)                     | 41.9 (n=18)          | 24.2 (n=43) |
| 3 to 5              | 34.5 (n=10)                     | 65.5 (n=19)          | 16.3 (n=29) |
| More than 5         | 60.0 (n=3)                      | 40.0 (n=2)           | 2.8 (n=5)   |
| **Age (year old)**  |                                 |                      |
| 17-25               | 70.6 (n=48)                     | 29.4 (n=20)          | 38.2 (n=68) |
| 26-32               | 50.0 (n=29)                     | 50.0 (n=29)          | 32.6 (n=58) |
| 33-40               | 43.7 (n=14)                     | 56.3 (n=18)          | 18.0 (n=32) |
| 41-50               | 64.7 (n=11)                     | 35.3 (n=6)           | 9.5 (n=17)  |
| 51-60               | 33.3 (n=1)                      | 66.7 (n=2)           | 1.7 (n=3)   |
| **Education Level** |                                 |                      |
| Primary             | 66.7 (n=4)                      | 33.3 (n=2)           | 3.4 (n=6)   |
| Secondary           | 54.0 (n=27)                     | 46.0 (n=23)          | 28.1 (n=50) |
| Certificate         | 50.0 (n=17)                     | 50.0 (n=17)          | 19.1 (n=34) |
| Tertiary            | 59.5 (n=50)                     | 40.5 (n=34)          | 47.2 (n=84) |
| Others              | 75.0 (n=3)                      | 25.0 (n=1)           | 2.2 (n=4)   |
| **Occupation**      |                                 |                      |
| Working             | 52.1 (n=49)                     | 47.9 (n=45)          | 52.8 (n=94) |
| Jobless             | 71.4 (n=10)                     | 28.6 (n=4)           | 7.9 (n=14)  |
| Housewife           | 42.9 (n=9)                      | 57.1 (n=12)          | 11.8 (n=21) |
| Student             | 69.4 (n=34)                     | 30.6 (n=15)          | 27.5 (n=49) |
| **Monthly Income**  |                                 |                      |
| No income           | 65.3 (n=49)                     | 34.7 (n=26)          | 42.1 (n=75) |
| Under RM1000        | 57.1 (n=8)                      | 42.9 (n=6)           | 7.9 (n=14)  |
| RM1000 - RM3000     | 57.5 (n=23)                     | 42.5 (n=17)          | 22.5 (n=40) |
| RM3001 - RM5000     | 45.0 (n=9)                      | 55.0 (n=11)          | 11.2 (n=20) |
| RM5001 - RM7000     | 37.5 (n=3)                      | 62.5 (n=5)           | 4.5 (n=8)   |
| Above RM7001        | 40.0 (n=2)                      | 60.0 (n=3)           | 2.8 (n=5)   |
| Do not want to specify | 50.0 (n=8)                  | 50.0 (n=8)           | 9.0 (n=16)  |
Most respondents agreed that attitude (64.4%) was the main factor causing littering. This was followed by the lack of awareness (51.1%) and the ignorance on the effect of littering (47%). Forty percent of the respondents reported that they did littering as it was the easiest way to dispose litter, while 40% noted that laziness to search for a rubbish bin was the reason for littering. Other reasons for littering included the thought that someone else will do the cleaning (35.6%), unavailability of nearby rubbish bin (28.9%), inadequacy of rubbish bin (46.1%), there was already litter in the area (37.9%) and the lack of concern regarding the impact of littering (34.4%). Study found that the unavailability of rubbish bin can make a person litter [32]. Study reported on the relationship between trash bin distances and the behaviour of a person to dispose litter properly [33]. People litter because of the belief that someone else will pick up the litter and the unavailability of litter bin in the area [34]. A research indicated that many smokers do not believe the effect of cigarette butt littering has on the environment [35]. Meanwhile, a report noted laziness as a reason for people to litter [36]. On the other hand, littering is normally by external causes, for example, limitations of infrastructure, such as missing or filled garbage cans; also contributed by personal attributions, such as ignorance, naivety, and convenience [24].

![Figure 1. Factors influencing littering in Pantai Temasya Bintulu](image)

Of the total 178 respondents, 66.7% reported that beverage containers (aluminium can, glass, plastic) to be the most dumped litter in Pantai Temasya Bintulu. This was followed by 63.9% of the respondents admitting that cigarette butt is another major type of litter. Other litters included food packaging (plastics or paper materials), drinking straw, tissue paper, chewing gum, paper advertisement, newspaper and flyers with 58.3%, 53.3%, 48.9%, 41.7% and 39.4% respondents reporting them respectively. The littering problem has persisted and in connection with a trend towards increasing city inhabitants and more consumption outdoors (e.g., takeaway meals, beverages) [24].
4. Conclusion

This paper investigated the littering behaviour, major causes of littering and the most littered items. In general, a high percentage of respondents admitted that attitude was the main factor contributing to littering on the park. Littering is caused by a broad range of factors including attitudes, norms, knowledge, limitations and choices, routine development, and evaluative processes of justification as determinants of behavioural and decision making [37]. Littering behaviour was found to be directly related to the socio-economic characteristics. Results of this study also showed that beverage container (cans, glass, plastics), cigarette butt and food packaging whether made of plastic or paper comprised the largest portion of litter in Pantai Temasya Bintulu.

This paper can benefit the authority to target litter prevention and increase efforts to reduce problems of littering particularly involving greenspaces. Public perception and attitude studies related to park littering are important to administrative and strategic planning purposes. Early education concerning littering must be taught by parents or guardians to ensure that the future generations are aware about its problem and to instil good attitude within the community.

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