

Poster Media to Promote Waste Separation for Tourists in Phra That Phu Si, Luang Prabang, Lao PDR

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Abstract

This study aims to create a waste separation poster to promote to tourist groups and set up separation bins to suit the activities of the tourist attractions. From the study of the amount and composition of waste in the Phra That Phu-Si area by separating components of the waste at 6 points according to different tourism activities, namely 2 points of waste from night market activities and 4 points of Phra That Phu Si activities. The results found that the amount of waste generated on average was 156 kg per day. Most of the waste found was recyclable plastic such as beverage bottles, followed by organic waste, metal, and glass, accounting for 30.37%, 23.18, 15.80, and 14.10, respectively. The type of waste varied with the activities of each data collection point. Moreover, it was found that the most common composition of waste was recycled waste (60.26%), organic waste (23.18%), general waste (15.42%), and infectious waste (1.14%).

From tourist's inquiries, tourists want posters to be installed at waste separating points and need a media that is easy to understand, takes a short time to read, and puts waste in the bin. Therefore, waste was segregated into 2 types, namely usable waste and unusable waste. As a result of installing posters at waste separating points, it was found that 38 percent of tourists were able to put waste matches in the bin, which was a good trend since the waste had never been sorted before disposal. The results of the evaluation of tourists' satisfaction with the poster promoting waste separation revealed that the tourists' satisfaction with the poster was at a high level. Most tourists suggest that they get knowledge from posters and help to stimulate awareness of waste separating before disposal.

Keywords: Poster Media, Waste Separation, Tourism Activity

1. Introduction

Luang Prabang Province is in the north of the country with an area of 16,875 square kilometers. The capital city was certified by UNESCO as a World Heritage City on December 9, 1995 which making this town known to tourists as a World Heritage City. Luang Prabang Municipality has divided the administrative area into 15 groups with a total population of 94,291 people. Nowadays, Luang Prabang, a World Heritage site, was facing problems with increasing tourist numbers and found the severity of various impacts from the expansion of tourism [1]. Garbage is a serious problem as well. At present, the total waste volume is more than 80.8 tons per day, with a waste generation rate of 0.85 kg/person/day. The municipal waste management system was operated by local municipality administrative for function collecting and transporting waste to landfills [2], which is greater than what JICA Nippon Koei Co., Ltd. [3] estimated in 2015 was the amount of municipal waste. The expected Luang prabang in 2020 is 75.6 tonnes per day.

Phra That Phu Si is one of the most popular cultural attractions in Luang Prabang which is located on the top of a mountain with a height of 150 meters, believed to be the mountain of the hermit. Therefore, he used the name Phu Si or hermit. At the viewpoint on the top of Phu Si, you can see the surrounding capital area, and on the top of Phu Si, there is a sacred relic [4] for that reason. Phra That Phousi is therefore an important tourist attraction of Luang Prabang and attracts a large number of tourists. therefore, causing more waste as well, most of the waste comes from market activities in tourist areas, resulting in various types of waste. The composition of the waste varies with the duration of tourism activities.

In the Phra That Phu Si tourist area, a solid waste management system has been set up by placing separate bins on the way to the relics, but it appeared that tourists left garbage without separating it and not throwing it in the trash bin. Consequently, unattractive, dirty and smelly landscapes affected tourist activities. Therefore, the agency responsible for the Phra That Phu Si area should set up a solid waste management system to impress tourists. Public relations media is one way to encourage tourists to waste separation due to the fact that this makes it easier to collect and dispose of. Moreover, recycled waste can be put back into the recycling process as well [5]. This research focused on solid waste management, existing and creating appropriate publications that are in accordance with the needs of tourists and providing knowledge about waste separation to promote sustainable tourism in Phra That Phu Si tourist attractions.

2. Method and Procedures

1. Solid waste composition

The composition of solid waste in the Phra That Phu Si tourist area was studied by quartering technique sampling at 6 points according to different tourism activities, as follows: the food stalls zone (location 1), the souvenir zone (location 2), the garbage collection point (location 3), the ticket counter (location 4), along the way up to the relic (location 5) and on the top of Phra That Phu Si (location 6) as shown in Figure 1. At least 25% of the total waste was sampled and used to classify the solid waste composition as shown in Figure 2.



Figure 1 Garbage collection and Separation at Phra That Phu Si
Source: Applied from Google map of Phra That Phu Si tourist attractions



Figure 2 waste Separation in the study area

2. Creation of public relations media

This research has created a knowledge-based media on waste separation by selecting the type of media created by asking tourists' requirement and using the data from the study of waste composition to create appropriate and in accordance with the context of the Phra That Phu Si tourist area.

3. Media test

Waste separation media is one component of the model for disseminating knowledge on how to properly separate waste in the Phra That Phu Si tourist area. The materials produced are accuracy reviewed by experts for content, language used, illustrations, overall composition for provide the efficient knowledge of waste separation.

4. Efficiency Evaluation of the media

Media has been revised on the advice of experts. The media was actually tested by 100 tourists in the study area and data collection for the satisfaction and efficiency evaluation of the media as shown in Figure 3, the grade range for satisfaction was defined as follows:

- Average score 4.51 – 5.00 means most satisfied
- Average score 3.51 – 4.50 means very satisfied
- Average score 2.51 – 3.50 means moderately satisfied.
- Average score 1.51 – 2.50 means less satisfied
- Average score 1.00 – 1.50 means least satisfied



Figure 3 The evaluation of satisfaction for promoted waste separating media

3. Results and Discussion

The results of a study on the quantity and composition of solid waste generated in the Phra That Phu Si tourist attraction during the normal tourist season, it can be summarized as follows:

1. The amount of solid waste

The tourist attractions of Phra That Phu Si are open from 8:00 am to 7:00 pm, while the night market is open from 4 pm to 10 pm. The Phra That Phu Si generated 156 kilograms of garbage each day on average. The waste density was 0.175 kg/liter. The area was set up in three colors (red, green, and blue) of 120-L bins at the attraction, but there were no signs or media for promoted waste separation. Garbage was found in every bin without separation, resulting in the same composition in all bins.

The waste composition was randomly selected from 6 sampling sites. At least 25% of the total weight of the waste was randomly selected at each point. A total of 52.85 kg of waste was randomly selected from 156 kg of total waste, representing 33.87%. The results of waste proportion were as follows: 1) Recyclable plastics such as PET beverage bottles was 30.37% 2) organic waste such as food scraps and banana leaf flowers for worshipping relics was 23.18% 3) metals such as aluminum cans for soft drinks, coffee was 15.80% 4) glass was 14.10% 5) general plastic waste was 9.74% as shown in Table 1.

Recycled waste was the most common waste in the area, followed by organic waste, general waste, and hazardous waste, respectively. Due to the activity of food stalls in the night market area, locations 1 and 2 found more organic trash than other locations. The majority of the organic waste discovered was food waste, but in the relic area, flowers and banana leaves were found to be the most organic wastes, with only a few food wastes. It could be seen that the composition varied depending on the activities of each sampling location [6], and that waste composition varies depending on consuming behavior, consumption habits, or individual waste management habits [7] and social activities, culture, and lifestyle [8].

Table 1 Composition of waste in the night market activity area and phra that phu si attraction

Type of Waste	Waste Weight (g) (Percentage)						Average (%)
	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	
1. Organic waste	5,600 (29.09%)	3,800 (31.54%)	1,600 (18.93%)	550 (8.46%)	-	700 (19.44%)	23.18
2. Beverage paper box	800 (4.16%)	600 (4.98%)	300 (3.55%)	150 (2.31%)	250 (8.06%)	150 (2.78%)	4.26
3. Plastic Recycle	4,050 (21.03%)	3,000 (27.96%)	3,350 (39.64%)	3,300 (50.77%)	1,250 (40.32%)	1,100 (30.56%)	30.37
4. General plastic (plastic bags, trays, tubes etc.)	1,300 (6.75%)	1,200 (9.95%)	1,100 (13.01%)	750 (11.53%)	200 (6.45%)	600 (16.67%)	9.74
5. Glass	3,000 (15.58%)	950 (7.88%)	1,400 (16.57%)	850 (13.08%)	750 (24.19%)	500 (13.89%)	14.10
6. Metal/Aluminum	4,100 (21.30%)	2,350 (19.50%)	600 (7.10%)	400 (6.15%)	600 (19.35%)	300 (8.33%)	15.80
7. Wood	250 (1.30%)	-	200 (2.37%)	100 (1.54%)	-	200 (5.56%)	1.42
8. Infectious Waste (Sanitary napkins, disposable diapers, tissue paper, masks)	150 (0.78%)	150 (1.24%)	100 (1.18%)	50 (0.77%)	50 (1.61%)	100 (2.78%)	1.14
Total Weight of Sampling (g)	19,250	12,050	8,650	6,150	3,100	3,650	52,850
Total Weight of all locations (g)	58	36	25	19	8	10	156

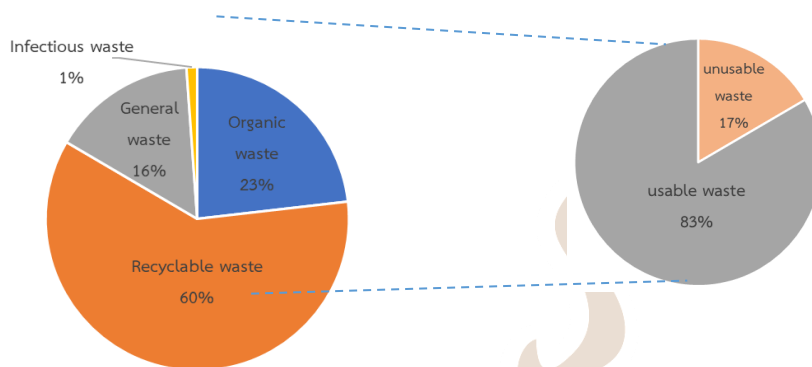


Figure 4 Proportion of solid waste found in Phra That Phu Si tourist attractions

From Figure 4, most types of waste found in the area are recycled waste accounted for 60.26 % such as plastic bottles, glass bottle and beverage cans. If only recycled waste is separated from other waste, it's mean that only 39.74% of the waste has to collect and transport to disposal at landfills. This will greatly for waste management.

2. Results of tourist Requirement

Tourists required poster media to be displayed at the bin, not printing media as brochures, because they become garbage and increase the amount of waste. The poster should be brief and concise, stressing the attitude before thrown away. In order to reach a decision quickly, the waste composition was determined to be mostly recycled waste. Due to the Phra That Phu Si had limited area, managing organic waste in the area was inconvenient. Furthermore, just 1.14% of hazardous waste was found, the majority of which came from toilets. As a result, waste separation at the Phra That Phu Si was focused on separating recycled waste from non-recyclable waste. So, the placement of 2 bins per location, 1 bin was recyclable waste and 1 bin was other wastes.

3. The satisfaction of tourists on the poster promoting waste separating in the Phra That Phu Si

The research results on waste composition and tourist requirements; the poster has been designed to emphasize the waste separation into 2 bins and help to raise awareness. Draft poster designed, sent to experts to review the content and suitability of the media, then adjusted along with the comment and translated into the Lao language. The layout of the posters is shown in Figure 4. The poster was tested by setting up 2 bins (recycle and other waste) at location 4. The bin was namely a recycling bin (yellow bin) and other waste bins (Blue bucket) and observed 100 tourists who came to visit Phra That Phu Si as a sampling group. The observation of tourists' behavior and asked about their satisfaction and opinions on the waste-separating poster. The poster was presented in Figure 4.



Figure 4 The format of a poster promoting waste separation in Phra That Phu Si area.

Table 2 The evaluation of tourists' satisfaction with the waste separating poster

No.	Issues	Satisfaction level poster (N = 100)		
		Average	S.D.	Satisfaction level
1	The content is interesting and relevant.	3.83	0.68	very satisfied
2	understanding of the content presented	3.74	0.69	very satisfied
3	Ordering knowledge content	3.78	0.77	very satisfied
4	Benefits of poster content	4.19	0.59	very satisfied
5	Appropriateness of poster design, such as color, font size, and use of illustrations.	3.78	0.61	very satisfied
6	efficiency and effectiveness of poster design	4.02	0.54	very satisfied
7	Overall satisfaction with this poster	4.12	0.51	very satisfied
Total Average		3.92	0.63	very satisfied

According to the evaluation of tourists' satisfaction with the waste separating poster, the results showed that the satisfaction average score from 100 tourists was 3.92, which was very satisfying. The most satisfaction was the benefits of poster content and there are some suggestions about posters such as posters using too much text to make it confusing due to tourists having a short time to travel. Posters should be bilingual (Lao and English language) to support foreigners to read it and setting up posters in every place where bins were placed in the Phra That Phu Si area.

4. The results of the observations showed that 38% of tourists were able to separate correctly, which corresponds to Yingyuad (2017) media helps to develop knowledge and awareness of waste management [9]. And can apply the knowledge of waste separation in daily life. The tourists 62% throw garbage to bin without paying attention to looking at the poster or

looking at the trash before throwing it away. When an incorrect type of waste occurs in a bin, subsequent groups of tourists dispose of their trash without separating them out due to seeing the wrong dumping. but depending on the conscience of tourists, because it was found that some tourists consider posters before left and make it separate properly.

4. Conclusion

Media design to promote waste separation in Phra That Phu Si area Starting from the study of the solid waste management existing and asked for tourists' requirement. The waste composition in the Phra That Phu Si was found that the proportion of recycled waste was the highest (60.26%), mostly plastic bottles (30.37%), metal (15.80%), and glass bottles (14.10%). Requirement from tourists, they wanted to install posters at the site and want to spend a short time in deciding to separate waste.

The results of the study were used to create poster materials and to determine the patterns in accordance with the behavior of tourists which it easier to throw and separate. So, waste separating was divided 2 bins (recycled waste and other waste). As a result, only 39.74% of the waste that must be send to municipal landfill which will help reduce the burden of municipal waste management as well as generate income from selling recycled waste. If organic waste was utilized (17%) that must be disposed of in municipal landfills. Thereby reducing the burden of management and extending the life of the landfill.

The findings of the study were utilized to develop poster materials and to identify patterns based on tourist behavior, making it easier to throw and separate. As a result, waste separation was split into two bins (recycled waste and other waste). As a result, just 39.74% of garbage must be disposed of in municipal landfills, easing the burden of local waste management while also generating revenue from the sale of recycled waste. If organic waste (17%) was used, it would have to be disposed of in municipal landfills. As a result, the management burden is reduced, and the landfill's life is extended

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