Tourist Behavior of Plastic Waste Reduction in the Coastal Area of Trang Province, Thailand

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Abstract—The objective of this study is to estimate the tourist behavior of plastic waste reduction in the coastal area of Trang Province, Thailand. 316 tourists (153 male, 163 female) traveling in the five districts along with the coastal area were included as the participants in this study. The results showed that 57% of the tourists were found to be good behavior. Amongst 14 variables in statistic analysis, knowledge was found that 57% of the tourists were found to be good behavior. The knowledge compain of plastic waste included as the participants in this study. The results showed that 57% of the tourists were found to be good behavior. The knowledge compain of plastic waste reduction ought to be promoted to increase of awareness among tourists for reducing plastic waste problem in the coastal area at early age. A greater emphasis must be placed on formulation and implementation of policies aimed at addressing the emerging problems of plastic waste in the costal area of Thailand.

Index Terms—Tourist behavior, plastic waste reduction, coastal area, Thailand.

I. INTRODUCTION

Over the past decades, plastic consumption has increased exponentially and led to parallel growth in mismanaged plastic waste [1], [2]. It is almost completely non-degradable and fragmented into microplastics in the marine environment [3], and as evidence of its hazards increases [4], greater attention is required to address this problem [5]. Trotter et al. [6] mentioned that plastic waste has direct negative effects on animals such as reduced growth rate, fecundity or life span. However, the indirect effects of plastic waste, which has the ability to sorb chemicals from the surrounding media, on chemical communication have yet to be investigated. Its impact is of global significance, and the threats posed by marine litter to humans and the environment have been recognized for around 58 years [7]. However, despite its importance, it has only gained real recognition during the past few years.

Presently, the plastic waste issue is a problem that has grown out of hand. Its costs to society and marine environments are immeasurable and irreversible. Its impact encompasses local, regional, national, and global scales and includes adverse effects on human health, aesthetics, the economy, public perception and and biologic interactions [8]. It can have land-based (e.g., direct from rivers and beaches, which is where the bulk comes from) as well as sea-based sources (e.g., waste disposal from shipping, oil rigs) [9]. Lebreton et al. [10] compiled the International Coastal Cleanup results as ‘Shoreline and recreational activities’ comprised 57%, ‘Ocean and waterway activities’ 6%, and the other 3 sources like ‘Smoking activities’ 37%. Based on the assessment that marine debris is rapidly accumulating in the center of the oceans, it is important to reduce solid waste inputs into the sea.

Trang Province locates in the Southern part of Thailand with approximately 119 kilometers of 5 districts for costal area. According to the data on tourist profile by the end of 2016, the tourist number and revenue are the third and fourth orders of Southern part of Thailand, respectively [11]. From the report of Trang Provincial Administrative Organization [12] reported that more than 240,621 tons of total solid waste was generated in 2017. The low efficiency of solid waste management including separation, collection, transportation processes was presented in Trang province. Hence, there are the high chance of being able to enter the beach and the sea.

The transformation of a region into a tourist destination causes changes in socio-spatial relationships, leading in many situations to the disfigurement of natural landscapes and environmental degradation. Silva et al. [13] indentified that the lack of education of the tourists and beaches users, who throw away the garbage produced by them on the sands of the beaches. The educational efforts such as signs at the entrance of the beaches, educational campaigns on a local or national scale, beach-cleaning activities to reduce the waste; increase the cleaning frequency on beaches; strengthen law enforcement in coast areas; reduce the use of disposable items on the coastal area should be recommenced [14], [15].

This study was to evaluate the tourist behavior of plastic waste reduction in the coastal area of Trang Province, which is the one of the many tourist coastal area of Thailand. Firstly, the plastic waste reduction of tourist behavior in five district of coastal area in Trang province was to explore. The association and best predictor of tourist behavior for plastic waste reduction were investigated by logistic regression and multiple logistic analyses, respectively.

II. MATERIAL AND METHODS

A. The Study Area

Data for this research was collected by developed questionnaire focusing on plastic use reduction among Thai
tourists in the coastal area of Trang Province, Thailand. Five districts in the coastal area of Trang Province including Sikao, Kantrang, Yan Ta Khoao, Hatsam ran and Palian were included as the study area. Fig 1 shows a map of the coastal area of Trang Province, Thailand. The data based on the developed questionnaire was collected during March – May 2019 after approving by Committee for Research Ethics, Mahidol University (COA. No. 2019/122.2105). A total of 316 respondents were included in this study. The target population in this study was the tourist in five districts of the coastal area of Trang Province. Tourists completed a questionnaire through face to face interview. Likewise, simple random sampling was used to select 316 tourists from each district.

Fig. 1. A map of the coastal area of Trang province, Thailand.

B. Questionnaire

Structured questionnaire based on the literature review was used in the study. This questionnaire was divided in four parts; demographic characteristics; knowledge of plastic waste reduction; altitude of plastic waste reduction; and behavior of plastic waste reduction. Tourist behavior of plastic waste reduction and predictor factor were determined. Reliability tests for the attitude part gave a value of 0.65 for Conbach’s Coefficient-Alpha.

C. Data Management and Statistical Analysis

The results are described by means of central tendency for each variable. In addition, the associations between behaviors of plastic waste reduction with independent variables were analyzed by chi-square tests. In addition, the independent variables with a p-value < 0.25 in bivariate analysis were included in the full model of multiple logistic regressions along with their 95% confidence interval. All the analysis was performed by using IBM SPSS V 20.

III. RESULT AND DISCUSSION

A. Characteristic of Tourist

According to the data from the questionnaires (Table I), more than 51% of tourists in this area were female. The majority of tourists (46.8%) were bachelor degree and above for education background. Most of them (60.1%) were in the married status. More than 27.5% of tourists have the own business with more than 15,000 Baht (27.8%) for monthly income. Concerning the residency profile, over 60% of tourists were stayed in this province with third time visit (28.5%). The main propose (58.9%) of visit from tourist were leisure with one day trip (66.1%). Most tourist involvement and motivation in this province on the plastic reduction were reduce plaster used (41.1%) and community commend (44.9%), respectively

| TABLE I: DEMOGRAPHIC INFORMATION OF PARTICIPANTS (N=316) |
|-----------------|--------|--------|
| Items           | Number | Percent |
| Sex             | Male   | 153    | 48.4  |
|                 | Female | 163    | 51.6  |
| Education       | No school | 1 | 0.3  |
|                 | Primary school | 57 | 18.0 |
|                 | Secondary school | 110 | 34.8 |
|                 | Bachelor and above | 148 | 46.8 |
| Status          | Single | 106    | 33.5  |
|                 | Married | 190    | 60.1  |
|                 | Divorce | 18     | 5.7   |
|                 | Widow   | 2      | 0.6   |
| Occupation      | Own business | 87 | 27.5 |
|                 | Employee | 75    | 23.7  |
|                 | Farmer   | 49     | 15.5  |
|                 | Government officer | 38 | 12.0 |
|                 | Private office | 43 | 13.6 |
|                 | Housewife | 10    | 3.2   |
|                 | Student  | 14     | 4.4   |
| Income (Baht)   | Less than 5000 | 25 | 7.9  |
|                 | 5000-7000 | 55 | 17.4 |
|                 | 7000-10000 | 81 | 25.6 |
|                 | 10000-15000 | 67 | 21.2 |
|                 | More than 15000 | 88 | 27.8 |
| Residency       | In Trang | 193 | 61.1 |
|                 | Outside Trang | 123 | 38.9 |
| Number of Visit | Several time | 82 | 25.9 |
|                 | First time | 58    | 18.4 |
|                 | Second time | 85    | 26.9 |
|                 | Third time | 90    | 28.5 |
|                 | Fourth time | 1     | 0.3   |
| Trip purpose    | Natural tour | 68 | 21.5 |
|                 | Leisure  | 186    | 58.9  |
|                 | Eating   | 22     | 7.0   |
|                 | Diving   | 26     | 8.2   |
| Duration        | One day trip | 209 | 66.1 |
|                 | Stay overnight | 56 | 17.7 |
|                 | Two nights | 47     | 14.9  |
|                 | More than 2 night | 4 | 1.3 |
| Involvement     | Reduce plaster used | 130 | 41.1 |
|                 | Proper dispose | 64 | 20.3 |
|                 | Purpose the suggestion | 21 | 6.6 |
|                 | Reduce plastic used and proper dispose | 37 | 11.7 |
|                 | Proper dispose and purpose | 51 | 16.1 |
B. Knowledge, Attitude and Behavior of Plastic Waste Reduction

Table II indicated the level of knowledge, attitude and behavior for plastic use reduction of tourist. Most of tourist (60.1%) has the poor knowledge of plastic waste reduction. The good attitude for plastic waste reduction was found in the more than 76% of tourist in this province. For plastic waste reduction behavior, 57.0% of tourist was good behavior. For statistical analysis (Table III), tourists who were high knowledge had a good behavior for plastic waste reduction. Multiple logistic regression analysis revealed that high knowledge tourist was 5.6 times more likely to good behavior for plastic use reduction (Adj. OR 5.676; 95% CI: 3.36-9.58).

| Items          | Number | Percent |
|----------------|--------|---------|
| Motivation Commend | 40     | 12.7    |
| People commend   | 17     | 5.4     |
| Community commend| 142    | 44.9    |
| Reward           | 10     | 3.2     |
| Punishment       | 174    | 55.1    |

Among the reasons for the lack of behavior change are, influencing knowledge of environmental issues, but also enhancing visitor experiences and thus their satisfaction [16]. It has only been in recent years that the power wildlife tourism has to affect change and the assumption of attitudes leading to behavior change in this sector have been recognized, in particular that a general attitude about a thing has been proven in numerous studies to not lead to specific behaviors. Further, it is now recognized that interpretive and educational experiences provided to tourists will not change behaviors “unless a specific behavior is explicitly targeted and communication is designed to address attitudes relevant to that behavior” [17].

**TABLE II: LEVEL OF KNOWLEDGE, ATTITUDE AND BEHAVIOR OF PLASTIC WASTE REDUCTION**

| Items                           | Number | Percent |
|---------------------------------|--------|---------|
| Knowledge                       |        |         |
| Poor                            | 190    | 60.1    |
| Good                            | 126    | 39.9    |
| Attitude                        |        |         |
| Poor                            | 74     | 23.4    |
| Good                            | 242    | 76.6    |
| Behavior                        |        |         |
| Poor                            | 136    | 43.0    |
| Good                            | 180    | 57.0    |

**TABLE III: ASSOCIATION AND PREDICTION WITH PLASTIC WASTE REDUCTION**

| Items            | Poor | Good | COR  | Lower | Upper | P value |
|------------------|------|------|------|-------|-------|---------|
| Age              |      |      |      |       |       |         |
| Below 34         | 60   | 40.8 | 87   | 59.2  | 1     |         |
| Over 34          | 76   | 45.0 | 93   | 55.0  | 0.844 | 0.540   | 1.320  | 0.457 |
| Sex              |      |      |      |       |       |         |
| Male             | 65   | 42.5 | 88   | 57.5  | 1     |         |
| Female           | 71   | 43.6 | 92   | 56.4  | 0.957 | 0.613   | 1.495  | 0.847 |
| Education        |      |      |      |       |       |         |
| Lower than bachelor | 86  | 43.0 | 114  | 57.0  | 1     |         |
| Bachelor and higher | 50  | 43.1 | 66   | 56.9  | 0.996 | 0.627   | 1.580  | 0.986 |
| Status           |      |      |      |       |       |         |
| Single           | 62   | 49.2 | 64   | 50.8  | 1     |         |
| Couple           | 74   | 38.9 | 116  | 61.1  | 1.519 | 0.963   | 2.394  | 0.072 |
| Occupation       |      |      |      |       |       |         |
| Regular income   | 76   | 48.7 | 80   | 51.3  | 1     |         |
| Irregular income | 60   | 38.2 | 97   | 61.8  | 1.536 | 0.980   | 2.408  | 0.061 |
| Level of Income  |      |      |      |       |       |         |
| 10000 or less    | 69   | 42.9 | 92   | 57.1  | 1     |         |
| More than 10000  | 67   | 43.2 | 88   | 56.8  | 0.985 | 0.631   | 1.538  | 0.947 |
| Resident         |      |      |      |       |       |         |
| In Trang         | 86   | 44.6 | 107  | 55.4  | 0.852 | 0.539   | 1.348  | 0.494 |
| Outside Trang    | 50   | 40.7 | 73   | 59.3  | 1     |         |
| Number of visit  |      |      |      |       |       |         |
| Several time     | 28   | 48.3 | 30   | 51.7  | 1     |         |
| Few times        | 69   | 39.2 | 107  | 60.8  | 1.281 | 0.773   | 2.124  | 0.337 |
| Trip purpose     |      |      |      |       |       |         |
| Leisure          | 76   | 40.9 | 110  | 59.1  | 1.241 | 0.789   | 1.950  | 0.350 |
| Other            | 51   | 54.3 | 43   | 45.7  | 1     |         |
| Duration         |      |      |      |       |       |         |
| One day trip     | 90   | 43.1 | 119  | 56.9  | 0.997 | 0.632   | 1.596  | 0.990 |
| More than one day| 46   | 43.0 | 61   | 57.0  | 1     |         |
It can be concluded that this study provides the foundation for high level of behavior for plastic waste reduction of tourist in Thailand. Hence, it confirms the strong predictors of knowledge of plastic waste reduction with the behavior of plastic waste reduction among Thai tourists in the coastal area of Trang province, Thailand. The knowledge of plastic waste reduction ought to be promted to increase of awareness among tourists for reducing plastic waste problem in the coastal area at early age. A greater emphasis must be placed on formulation and implementation of policies aimed at addressing the emerging problems of plastic waste in the coastal area of Thailand.

IV. CONCLUSION

The purpose of this study was to determine the level and predictor of behavior among Thai tourist for plastic waste reduction in the coastal area of Trang province, Thailand. Five districts in the coastal area of Trang Province were included as the study area. The logistic regression and multiple logistic regressions were used to determine the association and the best predictor for plastic waste reduction among Thai tourists. The results performed that knowledge of plastic waste reduction were found to be the most significant predictors of good behavior.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Conceptualization, and methodology, C.R.; data collection, P.S., T.T.S.; data analysis, O.L.; writing, W.O.; funding acquisition, C.R.

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